

JAPAN DENTAL ASSOCIATION
THE FELLOWSHIP OF THE INTERNATIONAL SCIENTIFIC EXCHANGE FUND
RESEARCH ACCOMPLISHMENT REPORT

Name of Recipient: Dr. EI EI AUNG	Period of Fellowship: 1 April 2019 to 31 March 2020
Research Subject: Public-Private Partnerships: Complementary Efforts to Community Oral Health Promotion	
Host Institution in Japan: Department of Oral Health Promotion Tokyo Medical and Dental University	Host Supervisor in Japan: Professor Yoko Kawaguchi
Accomplishments during your stay in Japan: (If this space is not enough, please attach a report) <p style="text-align: center;">(Full report is attached by separate file)</p>	
Publications: 1. Aung EE, Zaitso T, Oshiro A, Kawaguchi Y. (2019). "Oral Malodor Knowledge among Myanmar Dental Students and Young Dentists." Journal of Dentistry Open Access. 2019;1 (1). DOI: 10.31487/j.JDOA.2019.01.02 2. Aung EE, Zaitso T, Oshiro A, Kawaguchi Y. (2019). "Relationship of Halitosis Concern with Oral Health Behaviors and Knowledge Among Myanmar People." Journal of Dentistry Open Access. 2019; 1(1). DOI: 10.31487/j.JDOA.2019.01.03	
Presentations at Academic Meetings: 1. Poster presentation at 68 回日本口腔衛生学会 entitles of "Relationship of halitosis concern with oral health behaviors and knowledge among Myanmar people." 2. Oral Presentation at Global Tobacco-Free Summit TID 15th Annual Conference entitles of "Current Situation of Smokeless Tobacco Consumption and Oral Health Impact in Myanmar."	
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Date: 9 March 2020

Report on
the fellowship of International Scientific Exchange Fund
From Japan Dental Association
2019 – 2020

By

Dr. Ei Ei Aung

MYANMAR

Host Institution:

Professor Yoko Kawaguchi

Department of Oral Health Promotion

Tokyo Medical and Dental University, Japan.

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ACKNOWLEDGMENT

Firstly, I would like to express my heartfelt thanks to the Japan Dental Association (JDA) for generous support to this year-long fellowship for the development of dental science and services through international scientific exchanges. Secondly, I wish to express my deepest and sincere gratitude to Professor Yoko Kawaguchi from Department of Oral Health Promotion, Tokyo Medical and Dental University for kindly hosting me to learn and share oral health-related knowledge among dentists, dental researchers and dental students from different countries. Moreover, I would like to thank all teachers and members of the Department of Oral Health Promotion for their assistance and the friendly environment during my stay in Japan.

EXECUTIVE SUMMARY

This is the report to the Japan Dental Association (JDA) by Dr. Ei Ei Aung for the completion of the year-long (from 1st April 2019 to 31st March 2020) fellowship of International Scientific Exchange Fund. Professor Yoko Kawaguchi accepted me in her department of Oral Health Promotion (OHP), Tokyo Medical and Dental University, Tokyo, Japan, during the fellowship period.

While I was in OHP, I have learned about life-stage oral health promotion activities in Japan, and also how Japan is operating and managing the Public-Private Partnerships (PPPs) to support oral healthcare services. Japan is one of the countries where private dental practitioner is carrying out the role of a school dentist, and the dentist is responsible for the performance of school oral health activities, usually in a part-time capacity. This public and private mixed dental performance are one of the unique characteristics of the Japanese oral healthcare system. (for example, school oral checkup offer by private dentists, etc.) I have learned that partnership is a potent force in the shaping of healthcare and can lead to improvements in efficiency, innovation, and access to services.

Additionally, I participated and presented in the local and international conferences, and also attended the "Essential Expertise for Clinical Dentistry" offered from Tokyo Medical and Dental University.

I am sure that I could contribute what I have learned from this fellowship to my country, Myanmar, community oral health development by promoting human resource effort.

What can we (Myanmar) learn from Life-stage oral health promotion of Japan

Introduction

Nowadays, people live longer than ever before. To stay healthy in the later years, paying more attention and extra care to the oral cavity is crucial as age brings various oral health problems such as tooth loss, dry mouth, gum diseases, etc. [1]. Although oral healthcare is a very low priority compared with other infectious and non-infectious diseases, it can significantly exacerbate the negative impact on people's well-being and quality of life [2]. Moreover, difficulties in eating, swallowing, and speaking due to the consequences of oral health problems affect the individual daily life [3].

Oral health is an integral part of general health. Oral health interacts with a variety of non-communicable diseases (NCDs) and shares a common risk factor such as smoking, betel quid chewing, alcohol drinking, poor diet, and oral hygiene habits [2]. Oral health promotion by reducing and controlling these risk factors has a significant impact on many other NCDs at low-cost with high-efficiency. Therefore, proper oral health care throughout the life-stage is necessary to achieve health and wellness throughout life.

Allocating and the best use of limited healthcare resources becomes challenges in many developing countries because of the increasing burden of diseases and weak health system. As oral healthcare treatments are expensive and need high technology, getting equity in oral healthcare to all sections of the population would exceed the total oral healthcare budget. Oral health promotion measures and preventive strategies are undeniable cost-effective and suitable [4]. Moreover, emphasizing preventive and promotive approaches are more beneficial than a curative care

approach. The promotion of health projects throughout the life span is the investment in health [5]. Therefore, oral health promotion should integrate with other health promotion programs in schools, workplaces, and community health centers.

Recently, Myanmar government has committed to achieving Universal Health Coverage (UHC) by 2030, and basic essential dental health services are part of the provided services [6]. During the healthcare system transition, it is necessary to implement the preventive approach aimed to avoid dental diseases, which will lead to extremely costly to the government.

Background information of two countries

Japan is situated in Northeast Asia and is composed of four main islands, and the total area of the land is 378,000 square kilometers. Tokyo is the capital city, and there is over 126.8 million population with densely populated urban areas. Japan is one of the developed countries with the national gross domestic product (GDP) was 4.937 trillion US dollars in 2016. Health expenditure is about 10.93% of total GDP [7].

Myanmar is located in Southeast Asia and is composed of seven states, seven regions, and Union Territory named "Nay Pyi Taw." It is the capital city of Myanmar. Compared with Japan, Myanmar has a wider (nearly twice) land area of 680,000 square kilometers, with 51.4 million population (approximately half of Japanese people), and almost 30% of them lives in urban areas, according to the latest Population and Housing Census in 2014 [8]. There are 135 ethnic groups speaking over 100 languages and dialects. Myanmar is one of the developing countries with the national gross domestic product (GDP) was 63.256 billion US dollars, in 2016, according to the World Bank statistical information. Health expenditure is about 5.09% of the total GDP as of 2016 [7].

Regarding the oral health personnel, in 2016, there were 104,533 dentists, 123,831 dental hygienists, and 34,640 dental technicians in Japan [9] while in Myanmar, there were 4539 dentists [10]. There is no exact data on the number of dental technicians in Myanmar, although there were 357 trained dental nurses in Myanmar until 2014 [11]. The dentist ratio per 100,000 people in Japan is 82.4, while in Myanmar, there are fewer dentists per 100,000 people (8.8 dentists). Dental hygienist roles in Japan are giving oral health education, contributing to the prevention of dental diseases, and assisting dental treatment. There is no dental hygienist in Myanmar.

Japan's public health care systems are well developed. Since 1961, Japan introduced a "Universal Health Insurance System" for the entire population, and dental health care services are included. People can receive most of the restorative and prosthetic treatments and surgical care at a relatively low cost. However, higher cost treatments such as gold crown and bridges, metal plate dentures, orthodontic treatment, and esthetic purpose dental treatment are excluded. Because of the aging population, Japan initiated "Long term care insurance" in 2000 to deliver health and welfare services to aging people.

Additionally, dental care services to bed-ridden people are also covered in this insurance scheme. Under health insurance, adult patients have to pay only 30% of the total fee, 10% to 30% direct payment is needed for elderly and 0% for low-income earners. However, preventive services are excluded in the current insurance scheme. Per capital dental health expenditure in Japan is 6.7% (approximately 203 USD) of total health expenditure 3,030 USD [9].

In Myanmar, there is no national health insurance program except limited access to health insurance offered by the Social Security Scheme (SSS) [12], until now. Private clinics are leading dental healthcare providers, and therefore, many people cannot afford to get necessary dental

treatments, then leads to significant unmet needs for care. Although there are public dental healthcare services, it is deficient in public services utilization [10], and it might be due to many reasons such as long waiting times, insufficient healthcare facilities, low-quality services, etc. Although the total health expenditure in Myanmar was found to be increasing annually from 1998 until now, it is still a meager amount of per capital total health expenditure (approximately 103 USD- in 2014) [7]. It is nearly 30 times lower than in Japan.

Lifelong oral healthcare services and programs in Japan

With the improvement of living standards and the public health system, Japan has attained the highest average life expectancy and healthy life expectancy in the world. Lifelong oral healthcare services and promotion activities (Table 1) are provided based on health-related laws and acts [9]. In addition to these nation-wide oral healthcare services and promotion activities, local governments, professional organizations (such as Japan Dental Association) and institutions, private dentists' groups are also supporting not only the dental health care but also the excellent life care of elderly in the Japanese society.

Table 1. Life-stage oral healthcare services and promotion activities in Japan.

Target group	Law/Act	Activities under law	Additional Campaign/Activities
Pregnant women, infants, and pre-school children	Maternal and Child Health Act (1965)	<ul style="list-style-type: none"> - Oral health examination for 18-month-old and 3-year-old children. - Health education on nutrition, diet, and oral health care. 	<ul style="list-style-type: none"> - 8020 Campaign (established in 2000) was set out to help people to keep 20 or more of their own teeth until the age of 80. - National health promotion Campaign for 21st-century "Healthy Japan 21" to prevent lifestyle-related diseases. - Fluoride application for caries preventions by local governments - Educational poster/TV commercials encouraging people to receive periodical checkups
School Children	School Health and Safety Act (1958)	<ul style="list-style-type: none"> - Health examination and health education at every school. - Fluoride mouth rinsing program 	
Adults Employees	Industrial and Safety Health Act (1972)	<ul style="list-style-type: none"> - Worksite health examination (some companies provide oral health examination also) and oral health promotion activities. - Periodontal diseases examination 	
All population	Health Promotion Law (2003)	<ul style="list-style-type: none"> - Nutrition and Health survey including oral health examination - Stop passive smoking activities. 	
All population	Act on the Promotion of Dental and Oral Health (2011)	<ul style="list-style-type: none"> - Prevention of Oral diseases 	
Elderly	Long term care insurance Law (2000)	<ul style="list-style-type: none"> - Health and welfare services 	
	Act on Securing Medical care for older adults (2008)		

Because of all these combined forces, cooperation, and public-private partnerships effort under the life course oral healthcare perspective, Japan's oral health status has been dramatically improved in the past 40 years. For 12-year-olds DMFT (decayed, missing and filled teeth in permanent dentition) was 4.6 in 1985 and decreased to 0.8 in 2016. for adults and the elderly, The mean number of natural teeth present increased from 1957 to 2016 with 25.1 to 28.2 in adults (35-44 years old) and 10.1 to 20.8 in elderly (65-74 years old), respectively. Moreover, the proportion of the persons (aged 65-74 years) with edentulous decreased from 35.5% in 1957 to 4.1% in 2016. Although public dental services are offered the same throughout Japan, there remain some regional differences [9]. Through the above public health care system, public perceptions become changed and improved awareness of oral health, including the use of different fluoride strategies, tooth brushing behavior, reduced sugar consumption, increased regular professional checkup. Moreover, oral health providers and manufacturers' perceptions in Japan also changed with more collaboration work with public and private.

Myanmar's Opportunities and Choice

Recently, as many things are changing in Myanmar, including the health sector [13], it is time to create new opportunities for Myanmar's oral health sector improvement. According to the documented information of the last national oral health survey 2016-2017 [14], more than 98% of 6-year-old children have untreated carious primary teeth with decayed, missing, and filled teeth in the primary dentition (dmft) were 5.7. DMFT in permanent dentition of 12-year children (DMFT) was not high compared with other countries, including Japan. 12-year old DMFT is standard international comparison aged group and DMFT of 12-year children in Myanmar at a national level was only 0.8. However, the prevalence of untreated caries in permanent dentition of 12-year-old was 34.8% with high variation between geographic region. In the 60-74-years-old group, the mean number of present teeth in both male and female were

21.9 and 21.1, respectively. It is quite the same as Japan's condition. However, DMFT in this 60-74-year-old group was 11.4, with a high proportion of MT (9.9). These high treatment needs showed that there are some barriers to access oral healthcare services. Although the Myanmar people's oral health condition is not a server, the government need to take oral healthcare services improvement into account to promote peoples' well-being and quality of life.

As in recent, Myanmar government try to extend access to a Basic Essential Package of Health Services (EPHS) to the entire population by 2020-2021 while increasing financial protection with a strong emphasis on primary health care [15]. This is the right position of being able to make a choice the best system approaches and therapeutic measures from Japan and other developed countries to implement in Myanmar. Recent oral healthcare services in Myanmar mainly through the private sector, and many people cannot afford to get the necessary oral healthcare services and lack of awareness in oral healthcare from professional personnel. Because of the shortage of dentists in the public sector, Myanmar authorities need to learn how other countries' governments have engaged the private sector to deliver healthcare services with affordable prices and quality services through a public-private partnership. Additionally, policymakers should consider the type of oral health insurance system and treatment coverage under insurance. Although pay for service is still the primary form of payment in many developing countries [16], implementation of strategic purchasing with creating the right incentives (encourage to do more prevention for health care rather than expensive treatment approaches) is critical as Myanmar peoples' current oral healthcare needs to demand highly.

Strategies to expand access to oral healthcare services

- To get participation from basic health workers, school teachers, community leaders with clearly clarify the functional responsibilities in the primary oral healthcare setting.

- To give appropriate incentive (such as career development, provide the necessary support for the family of the healthcare workers) for better performance and staff retention especially who is working in the remote areas
- To allocate the existing human resource with equitable distribution based on the population needs.
- To increase financial investment in primary healthcare facilities: essential drugs and equipment.
- To develop Primary Oral Health Care as a substantial integral part of Primary Health Care
- To build a correlation between public and private oral healthcare sectors.

Recommendation for Myanmar

Life-course oral health prevention and promotion program since the early childhood period is highly recommended for Myanmar to promote the peoples' quality of life and well-being. Myanmar people also have to try to maintain the critical number of natural teeth (at least 20 teeth) because it is essential to be able to get the optimal chewing ability for the best nutrition. Fluoride mouth rinsing program is very cost-effective in caries prevention approaches in children. Additionally, it urgently needs to build cooperation and correlation between public and private oral healthcare sectors to promote the community oral health improvement.

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Achievements during fellowship

During the fellowship period, I participated and presented in the local and international conferences, as follows.

1. Poster presentation at 68 回日本口腔衛生学会 entitles of “ Relationship of halitosis concern with oral health behaviors and knowledge among Myanmar people.”
2. Oral Presentation at Global Tobacco-Free Summit TID 15th Annual Conference entitles of “Current Situation of Smokeless Tobacco Consumption and Oral Health Impact in Myanmar.”

Additionally, I continued my writing on previous manuscripts under the supervision of Prof. Yoko Kawaguchi and successfully published under the open access international peer-review journal named “JOURNAL OF DENTISTRY OPEN ACCESS (ISSN 2674-4155)”, as follows.

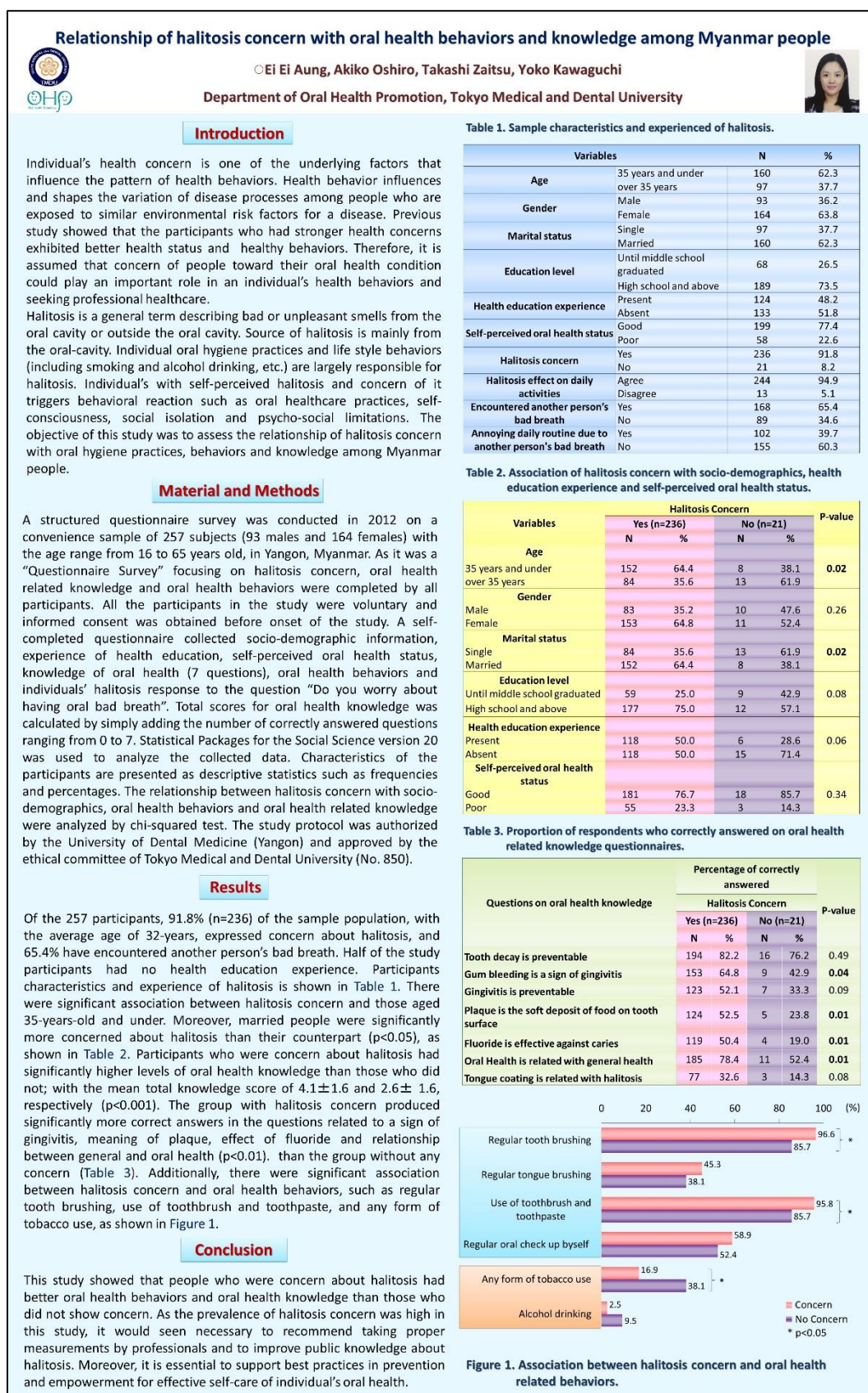
1. **Aung EE**, Zaitso T, Oshiro A, Kawaguchi Y. (2019). “Oral Malodor Knowledge among Myanmar Dental Students and Young Dentists.” Journal of Dentistry Open Access. 2019;1(1). DOI: [10.31487/j.JDOA.2019.01.02](https://doi.org/10.31487/j.JDOA.2019.01.02)
2. **Aung EE**, Zaitso T, Oshiro A, Kawaguchi Y. (2019). “Relationship of Halitosis Concern with Oral Health Behaviors and Knowledge Among Myanmar People.” Journal of Dentistry Open Access. 2019; 1(1). DOI: [10.31487/j.JDOA.2019.01.03](https://doi.org/10.31487/j.JDOA.2019.01.03).

Moreover, I attended the "Essential Expertise for Clinical Dentistry" provided by Tokyo Medical and Dental University. It is beneficial for the general clinical practitioner.

This year-long fellowship program is very beneficial to me to learn Japan’s life-long oral healthcare program, but also I can get experiences and expand my professional network while attending local and international conferences.

Appendix

1. Poster of 第 68 回日本口腔衛生学会



2. Presentation power-point of Global Tobacco-Free Summit TID 15th Annual Conference



TMDU
TOKYO MEDICAL AND DENTAL UNIVERSITY



Current Situation of Smokeless Tobacco Consumption and Oral Health Impact in Myanmar

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Myanmar (Burma)

Located in the Southeast Asian region and 676,578 square kilometers wide. Nay Pyi Taw is the capital city. Average life expectancy at birth is 64.7 years.



Population: 51.4 million

Under 15 years: 28.6%

15 to 64 years : 65.6%

65 and above : 5.8%

Aim

The aim of this study was to describe the current situation of smokeless tobacco (SLT) consumption and its oral health impact in Myanmar.

Method

This study reviewed **a total of 27 published research findings, reports and government documents** on prevalence, factors influencing on SLT use and its oral health impact among Myanmar population.

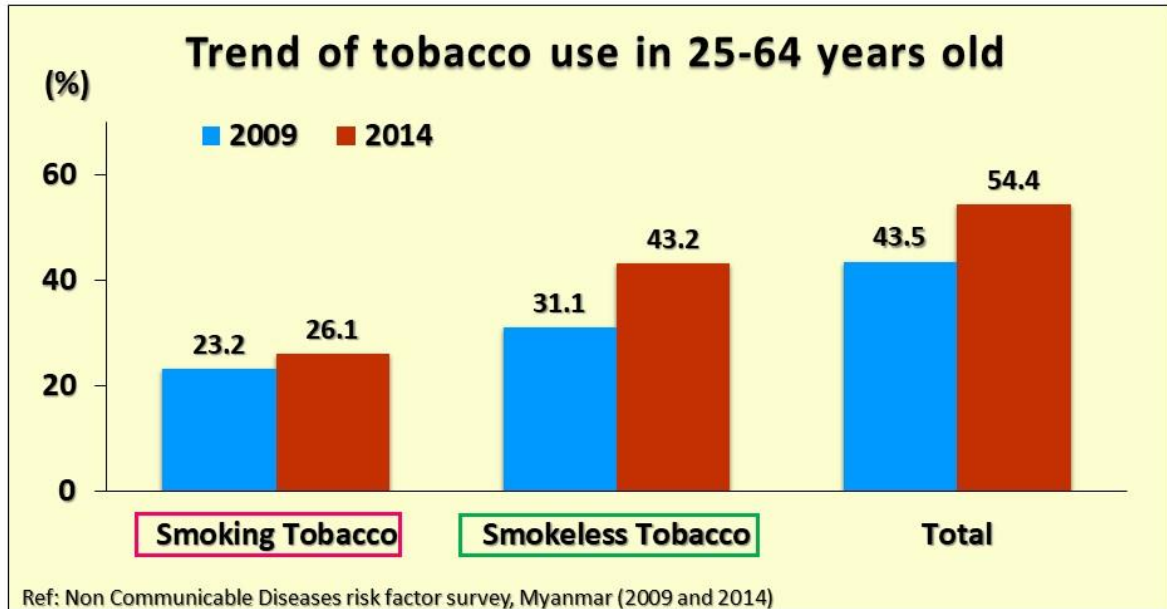
Review articles

Documents	Number	%
Research papers (International journals)	7	25.9
Review papers (International journals)	8	29.7
Research papers (Local journals)	5	18.5
Survey and reports (Myanmar government)	7	25.9
Total	27	100

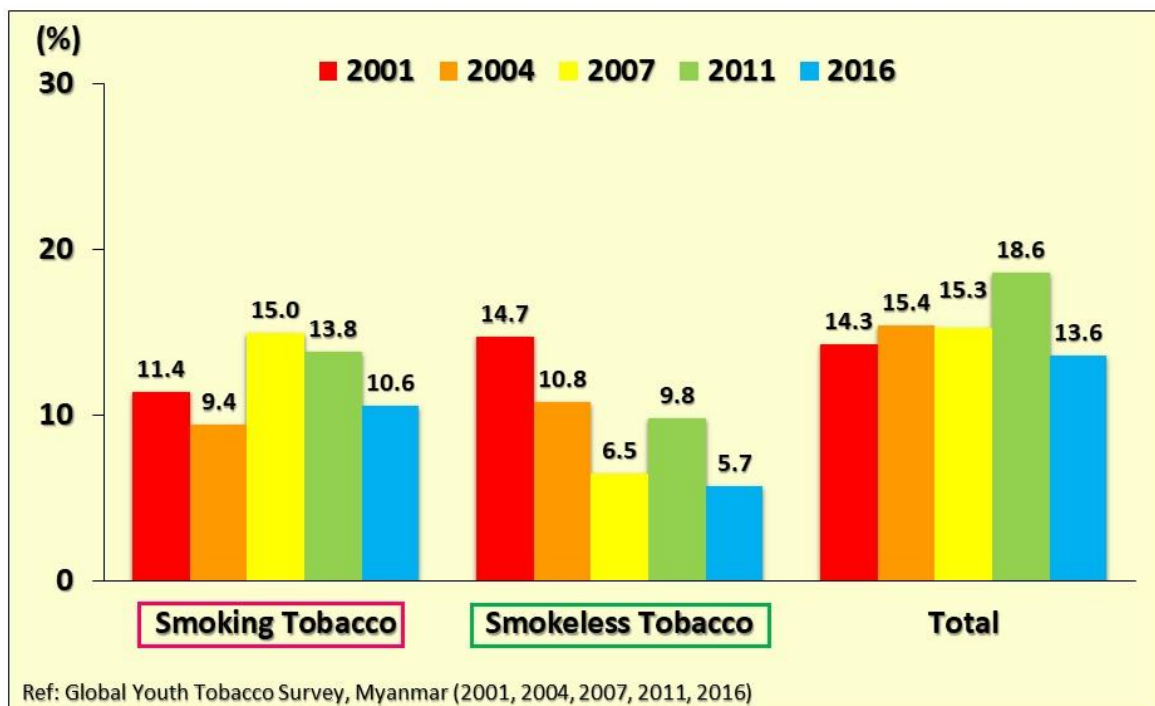
Overview of Tobacco Use

Tobacco is consumed in two forms:

Smoking tobacco and **Smokeless tobacco (SLT)**



Trend of tobacco use in 13-15 years old



Smokeless tobacco consumption

- More than **80% of global SLT users** lived in **Southeast Asian countries** including Myanmar and SLT use in these region is increasing.
- **Chewing betel quid with tobacco** is the most commonly used form of smokeless tobacco, in Myanmar (**nearly 85% of SLT users**).

- In Myanmar, betel quid chewing has been prevalent since **Pyu-Bagan Era (around 500-1000 AD)** and interwoven into **social customs** and **religious practices**. (Indian journal of cancer 2014:51(5):3-7.)
- In traditional Myanmar culture, betel quid is offered to other persons as a **key sign of hospitality**, and many feel disrespected if this offer is refused.

What are the main contents in betel quid?

- The basic ingredients of betel quid are a pieces of **areca nut**, **betel leaf**, and **slaked lime**.



Areca nut



Betel leaf



Slaked lime

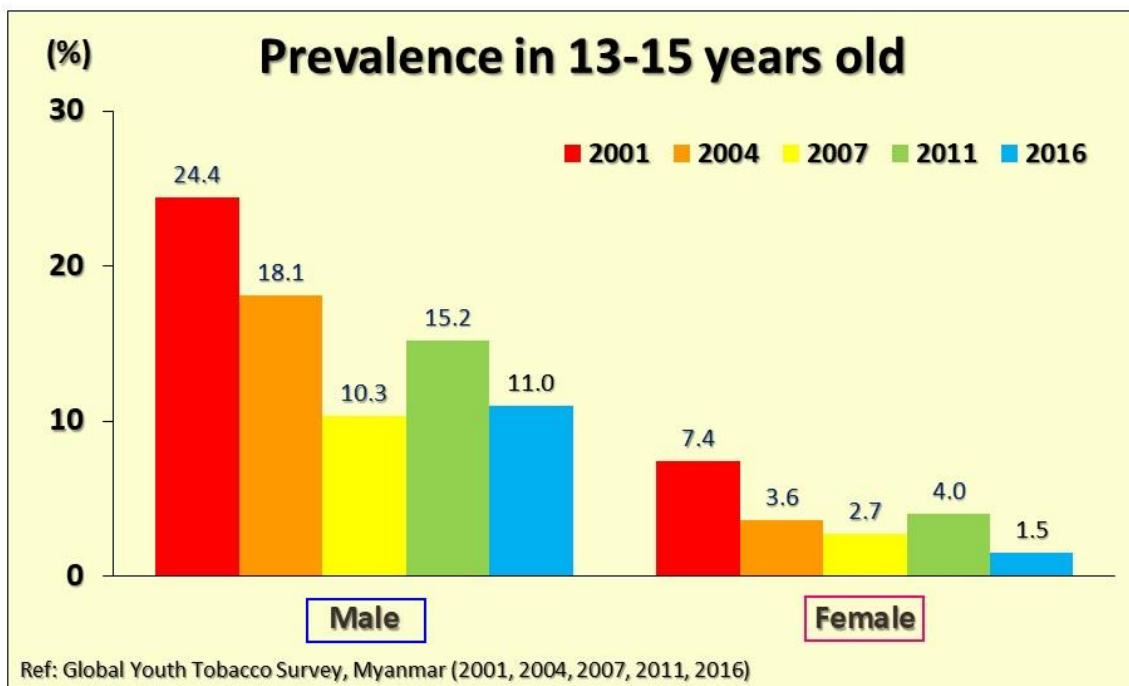
Photos from internet

Tobacco became a new ingredient in betel quid after it was traded across the continent since 16th century. The products made by mixing of tobacco and honey, alcohol or lemon juice is called **“hnat hsey”**

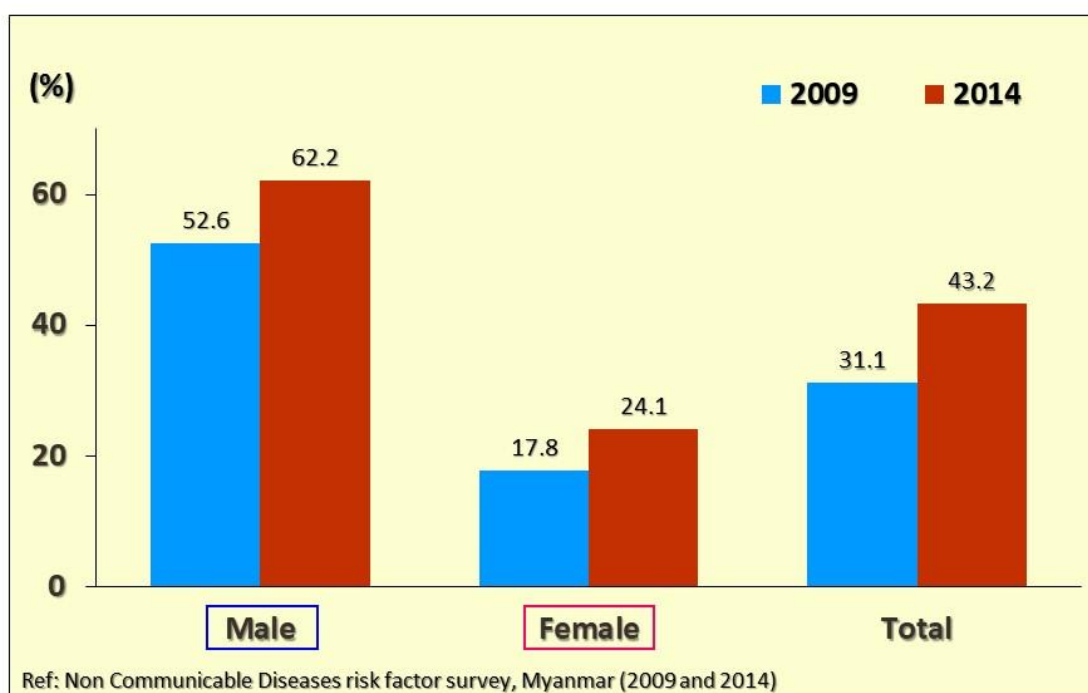


Photos from internet

Smokeless tobacco consumption



Prevalence in 25-64 years old



Factors influencing on betel quid chewing

- Betel quid chewing often starts in adolescence and is associated with smoking and drinking alcohol.
- Because of its addictive effect to betel nut and tobacco, most of the betel quid chewers had a long history of chewing habit **(average 15 years)**.

- Betel quid chewers begin to chew out of social pressure and to release stress and suffering.
- Moreover, they believe that chewing enhances social relationships, work activities, and their negotiation power with friends and family.
- Factors significantly associated with betel nut chewing were **male, current alcohol consumer, low socio-economic level, rural areas and having favorable belief on betel quid chewing**.

Do they change chewing behaviors in foreign country? (Japan)



Burden of smokeless tobacco

- Chewing betel quid with/without tobacco causes multiple health consequences.
- In Myanmar, tobacco is the **second most attributed risk factor** to healthy life loss.
- More than **65,651 people (WHO 2018)** die from tobacco-related disease, every year.
- **17.6% of all cause of death (2018)** are attributed by tobacco usage (including betel quid chewing).

Carcinogenicity of betel quid

Areca Nut (Arecoline)

- Increase collagen synthesis
- Damage fibroblast and DNA



Tobacco (Nicotine)

- Changes gingival blood flow
- Damage fibroblast and DNA



Slake lime (Calcium carbonate and trace elements)

- Ulceration
- Cellular turnover
- Damage DNA



Oral submucous fibrosis
Pre cancerous lesions
Oral cancer



Photos from internet

Oral health impact

- Betel quid chewing has been considered as one of the **important causative factors** for oral cancer.
- **More than 90%** of males with oral cancer had histories of habitual betel quid chewing.
- Oral Cancer stood at the **6th position in males** and **10th in females** with contributing to **3.5% of whole body cancers**, in Myanmar. (J Oral Pathol Med 2011;40:20-26)



Betel quid staining on the tooth surface and lip

Photos from internet

Oral cancer



Floor of the mouth



Tongue



Palate



Lip

<https://www.medicalnewstoday.com/>

- **Buccal mucosa and tongue** are most frequent site followed by floor of the mouth and the palate.
- According to the hospital-based cancer registries survey from 2002 to 2007, the number of oral cancer cases tended to be **upward** and this trend was statistically **significant in males**. (J Oral Pathol Med 2011;40:20-26)
- According to the study of Oral cancer in South East Asia in 2017, Myanmar was the **highest incidence** among SEA countries with age standardized rate **ASR of 6.2 per 100,000 and mortality was 3.8 per 100,000**. And also, it might be about **30% projected in 2020**. (Translational research in oral oncology 2017:1-9.)

- A study on betel quid chewing practice and its relation to oral pre-cancerous lesions documented that betel quid chewing **without tobacco were 6 times and with tobacco were 29 times** increase in risk of oral precancerous lesion than non-chewers.

(PloS One 2016;11(9):e0162081)

- Risk to oral cancer was **1.5 times higher in aged 40-60 years and 2 times in over 60 years** compared with aged under 40 years old. (PloS One

2016;11(9):e0162081)

- High prevalence of oral lesion cases were seen aged **over 40 years** (around 35% to 50%) of the **CASES**. (Myanmar Dental Journal 2000:3(2), 2012:19(1), 2018)

- A study on relationship with SLT and oral health status reported that there is a **significant association between periodontal conditions and betel quid chewing habit**.

- **High prevalence** of periodontal diseases (**pocket depth greater than 3 mm**) were found among betel quid chewers. (Myanmar Dental Journal 2000:3(2)).



**Poor periodontal health
in betel quid chewer**

Photos from internet

Challenges on smokeless tobacco use

- Weakness regulation in producing, marketing and labelling on smokeless tobacco products. (Tobacco Control Law was enacted in 2006.)
- Lack of human resource in tobacco control sector.
- Do not have specific budgets for Tobacco control and it is the **second least** Government's expenditures on tobacco control among SEAR countries.

- Not only the limited resources, **overlapping activities** is an issue in Myanmar, because there is hardly any coordination between funding partners.
- Limited research study to understand the psychosocial and behavioral factors that lead individuals to initiate and/or maintain betel quid chewing habit and also there is no study on economic burden of tobacco.

Conclusion

- SLT use in **13-15 years is decreasing**, but it is **increasing trend in adults** population.
- Strengthening the tobacco control legislation of smokeless tobacco products especially on availability and accessibility is urgently needed.
- Tobacco cessation interventions should be implemented at national level.

- It is vital to implement **culturally relevant comprehensive program** to focus on community's beliefs and perception on SLT use.
- **Health professionals (especially dentists) play a critically important role.** They should actively involve in counselling patients on the harmful effects of tobacco, and should make the proactive effort to identify oral lesions and timely refer to get the appropriate treatment to reduce the burden of tobacco-related diseases.



Thank you for your kind attention

3. Certificate of completion on "Essential Expertise for Clinical Dentistry."



Memorial Photos with host institution during fellowship



Photo at 68 Japanese Society for Oral Health (JSOH) (22 – 24 May 2019) with foreign postgraduate students of Oral Health Promotion Department, TMDU.



Photo at Global Tobacco-Free Summit TID 15th Annual Conference.



Photo at Global Tobacco-Free Summit TID 15th Annual Conference.



Presentation at Global Tobacco-Free Summit TID 15th Annual Conference.



Visit the Ministry of Health, Labour and Welfare (Oral Health Promotion Section) together with Malaysia Dental Officer from the Ministry of Health, Malaysia.



Visit the Ministry of Health, Labour and Welfare (Oral Health Promotion Section).



Photo at "Essential Expertise for Clinical Dentistry" Course.



Photo at "Essential Expertise for Clinical Dentistry" Course.



Photo together with Oral Health Promotion Department (Host institution) members.



The beauty of Autumn leaves – Visit the garden.



Cultural (traditional food) Party together with Department members



Volunteer in Myanmar Family Clinic and Garden (MFCG) – non-profit organization’s annual charity medical and dental checkup activity.

JAPAN DENTAL ASSOCIATION
THE FELLOWSHIP OF THE INTERNATIONAL SCIENTIFIC EXCHANGE FUND
RESEARCH ACCOMPLISHMENT REPORT

Name of Recipient: Nitesh Tewari	Period of Fellowship: 1 st August 2019 to 30 th September 2019
Research Subject: Clinical Pediatric Dentistry and Molecular Biology	
Host Institution in Japan: Nihon University School of Dentistry at Matsudo	Host Supervisor in Japan: Prof Koh Shibutani Dr Ujjal Kumar Bhawal
Accomplishments during your stay in Japan: (If this space is not enough, please attach a report) Report attached	
Publications: Detailed in report	
Presentations at Academic Meetings: Detailed in Report	
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Signature of Applicant: _____

Nitesh Tewari

Date: _____

30-09-2019

JAPAN DENTAL ASSOCIATION
THE FELLOWSHIP OF THE INTERNATIONAL
SCIENTIFIC EXCHANGE FUND
RESEARCH ACCOMPLISHMENT REPORT

Host Institution
Nihon University School of Dentistry at Matsudo, Chiba, Japan



NIHON UNIVERSITY

Period
1st August 2019 to 30th September 2019

Host Supervisors
Prof Koh Shibutani
Dean and Chair Department of Dental Anesthesiology
Dr Ujjal K Bhawal
Department of Biochemistry and Molecular Biology

Submitted by
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September 30th , 2019

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I. INTRODUCTION

At the outset I would like to convey my heartfelt gratitude to the entire board and directors of Japan Dental Association for selecting me for “The Fellowship of The International Scientific Exchange Fund” for the year 2019. I came to know about this fellowship in May 2018 when I was lecturing in Hospital for Sick Kids, University of Washington, Seattle, Washington, USA. I completed the form as per the requirements and submitted through my host institute- Nihon University Hospital School of Dentistry at Matsudo. It was a very happy moment for me and my family when my application was approved by Japan Dental Association in October 2018. I sought permission of my University and Ministry of health and prepared for this new journey in my professional career and personal life. This is a really good opportunity for the students and faculties like me who wish to explore more avenues of professional growth and improve their knowledge and expertise. As my primary research interest is in Dental Traumatology and regenerative dentistry, I was excited to know more about the excellent oral biology- molecular research facilities available in Japan. I wrote two research projects and communicated with my supervisors Prof Koh Shibutani and Dr Ujjal K Bhawal during this period and they agreed to allow me to learn and complete these advanced research projects in his lab.

On a personal note, Japan has always attracted me with its, mystiques, natural beauty and culture. Thus, the fellowship gave me a chance to walk out of my usual life in India to live two months in this extremely enchanting country.



Dr Ujjal K Bhawal Coming to receive me to take to the Nihon University Guest House in Hon Komagome. People queued up for Bust to the school.



Nihon University Hospital School of Dentistry at Matsudo, Chiba, Japan



II. NIHON UNIVERSITY HOSPITAL - SCHOOL OF DENTISTRY AT MATSUDO (NUSDM)

My learnings, experience and work

I shall always be indebted to Prof Koh Shibutani, Dean, Nihon University Hospital-School of Dentistry at Matsudo for extending me an invitation to learn new avenues of dental research. The first day in the University was interesting as I took two trains and a bus to reach this school. I would like to express my gratitude to Dr Ujjal K Bhawal who guided me at all steps from receiving at the airport, arranging accommodation at Nihon University Guest House in Hon-Komagome, Bunkyo-Ku to travelling with me on the first day.

My first impression to be here was of complete amazement. It is a big dental hospital with ultra-modern facilities for patient care. I met with Prof Shibutani and greeted him. I also met with other faculties of Department of Dental Anesthesia namely Dr Masatoshi Suzuki and Dr Michiharu Shimosaka. There was a major surgery going on that day and I was invited to observe that operation. I discussed the case with the oral and Maxillofacial surgeon and saw the procedure of jaw cyst enucleation. It was a great feeling and the procedures followed here were exactly I have read in text book of dentistry. It was a good experience to see them work as a team.

After the procedure, I took a round of all the clinical departments. It was wonderful to see the advanced dental operatories with students learning the clinical skills from the experienced teachers.

I would like to mention three departments in particular. First is the Department of Pediatric Dentistry. I met with Associate Professor Dr Shimizu who showed me the dental operatories in the right wing of 3rd floor. I am a pediatric dentist so was happy to look at the facilities in NUSDM. I saw cases being done under sedation which is very helpful to do dental procedures in children who are apprehensive and fearful. It was great to see the PhD students and young dental students to see these protocols and

learn. I was also excited to know about the preventive protocols followed in the department. I was told that in Japan, the oral health of children is one of the best in the world with very low prevalence of dental caries. I saw how these children are counselled and their parents taught about effective care and oral health maintenance. I would like to congratulate Japan Dental Association and professional associations like Pediatric Dentistry Society and School Dentist Association who are responsible for this excellent work.

Another department which I would mention is Department of Sports dentistry. It is a department which is non-existent in my country, however, sports dentistry is extremely important part of dental and maxillofacial trauma prevention among sports persons and athletes. It has been reported that sports injuries are leading cause of traumatic dental injuries in the world, especially among children and adolescents. I saw the facilities for fabrication of mouth guards and how the system works in NUSDM. I would like to develop a similar facility in my hospital and other parts of India when I go back.

Third department which is unique to Japan is the department of special care needs and disabled patients. I saw how the entire first floor of the dental hospital had the facilities for these patients. It was so heartening to see the patients of different age with special health care needs and disability, getting the oral health care with utmost affection. This facility is also not existent in India. There children with these conditions are seen by pediatric dentists and my hospital is the apex referral centre for these patients in entire country. However, the patients above 14 years have no specific branch of dentistry to take care of their needs. As a result the patients with mental disability, blindness, speech and hearing impairment etc have little or no access to oral health care. I would like to take this experience and develop this specialty in India. Best thing which I noticed was that the treatment done in difficult situations were never compromised.

They were at par with what I have seen in other developed countries like USA and UK. In coming weeks that I spent in NUSDM, I had several interactions with these specialities and saw how the dedicated faculty members teach the undergraduates, PhD students and fellows to be the best in clinical skills. I also saw how special emphasis is being given to learning foreign languages, especially, English so that they can learn more and interact with fellow dentists from other parts of the world. It was heartening to see the academic environment which is essential for best results in student life.



In the Operation Theatre of Oral and Maxillofacial Surgery



Different Clinical Departments of Nihon University School of Dentistry at Matsudo

During my initial experience, I saw the research facilities available at NUSDM. I was awestruck to see the number of labs which this institute has. In my country, dentistry is related to epidemiologic and clinical research and most of the dental students and post graduates so not have experience in basic sciences research. Institutes like AIIMS, New Delhi, where I work have advanced facilities available in medical departments and they are open for collaborations. However, I have always felt that my lack of understanding of basic sciences research especially oral molecular biology has always made me stay away from these collaborations. Another major drawback in my country is the cost of basic sciences research and funds available for researchers. It is very expensive to do the procedures like RT PCR and micro RNA studies and this always made me restricted to clinical researches of low impact. This was the primary reason I wanted to be on Japan and I was so fortunate to work in the advanced laboratories of Department of Biochemistry and Molecular Biology in NUSDM.

During my stay in the department, I was first introduced to the protocols of the lab. It was like a novel experience for me to behave like a lab researcher. I saw equipment, machines, reagents and special wings. I would like to mention a few of these which have helped me know a lot about molecular biology-

a. Molecular Biology Lab:

This lab is located on the 3rd floor and was my work are for most times in the fellowship. It has two parts where I used to observe and learn. One is the area for cutting of paraffin sections for preparation of slides and other is the main lab where the reagents are prepared and procedures are done for immunohistochemistry and RT PCR. I was fortunate to have Dr Ujjal Bhawal and three fellow colleagues from China who were working in the lab under various research projects. Dr Xiaoyan Li, Dr Juan Du and Dr Fengzhu Zhang were very helpful in guiding me and correcting my mistakes.

b. Immunohistochemistry:

I was taught how one can preserve the tissues from experimental animals of clinical human procedures in paraffin blocks. Then how these blocks can be expertly sections in thin slices by an advanced section cutter. These sections were later put on special glass slides with advanced coating. The suitability of slides was verified under optical microscope and then they can be preserved in advanced temperature-controlled storage facilities.

The procedure of immune histochemistry is helpful in knowing specific gene upregulation and down regulation in any specimen. The slides are first de-paraffinized using specific reagents according to a definite protocol and later stained by the selected primary antibodies. The slides are then kept overnight in temperature-controlled room and later stained by secondary staining. This is then seen under optical microscope and the gene expression is observed. I also came to know about the advanced microscope used for taking pictures of these stained specimens. This is located in a lab on 4th floor of NUSDM.

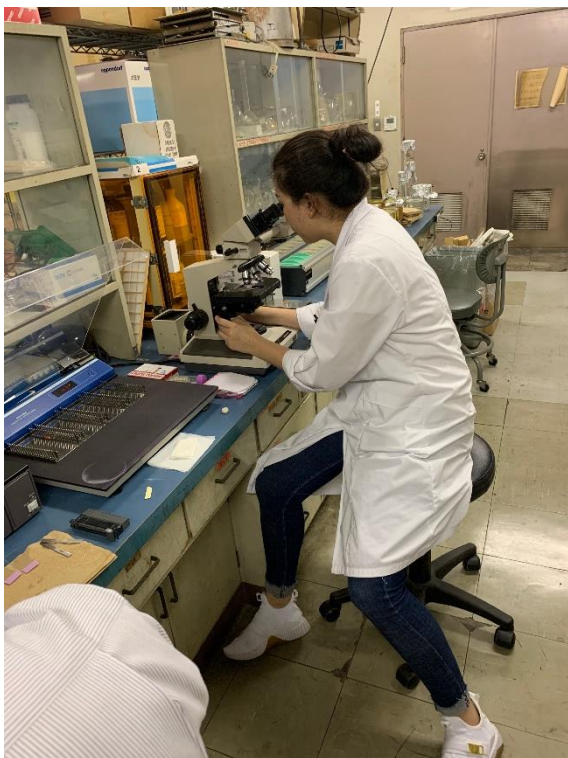
In my fellowship I was lucky to see the immunohistochemistry being done for different experiments. I now know how I can preserve the samples during my clinical surgical and biopsy procedures and how to know the gene expression in them. This knowledge will help me in designing high quality research procedures in future.

c. RT PCR:

RT PCR is known as one of rare and expensive procedures in my institute. I never knew how it is done and what are the equipment. I was demonstrated the protocol used in this lab and later I came to know about the details of Taqman probes, master mix and RTPCR machine. I saw this procedure being done for many projects during my stay. In future, this experience will help me in exploring more information in the research areas in dental traumatology.



Department of Molecular Biology, Nihon University School of Dentistry at Matsudo



Preparation of Slide from Paraffin Blocks and Immunohistochemistry



d. Micro CT:

The micro CT is also a very rare facility in India, available only in very advanced centers like Indian Institute of Technology, Delhi. I got to see how this procedure is done and how the data can be analyzed to gather information. The micro CT analyzed in my presence were from rat and mouse models. I will be able to use this experience in seeking better collaborations in future in India.

e. Cell Culture Room:

This was another work area where I used to learn. It is also located on the left wing of the 3rd Floor of NUSDM. This was a very good lab with best practices followed in every step. It had incubators, freezers, clean bench, spectroscope, ultrasonic proteinizer, cell counter and facility for reverse transcription for cDNA synthesis. Again, Dr Ujjal and his team led by Dr Xiaoyan Li were very helpful in teaching me everything.

f. Cell culture, subculture, cell counting, mRNA extraction, protein extraction and CDNA synthesis protocols:

I first observed how cells are cultured in media, later how they are sub-cultured and cells are counted. The different plates which are available, how the centrifuge works and how we can maintain the cells in growing stage. Later they were kind enough to let me perform the cell culture and subculture procedures.

The protocols for other procedures like mRNA extraction, protein extraction, cDNA synthesis and differentiation of cells were demonstrated to me. I tried to know every procedure, read about it from articles and asked questions. The faculty here were helpful to explain even the silliest of the questions.

g. Bioinformatics:

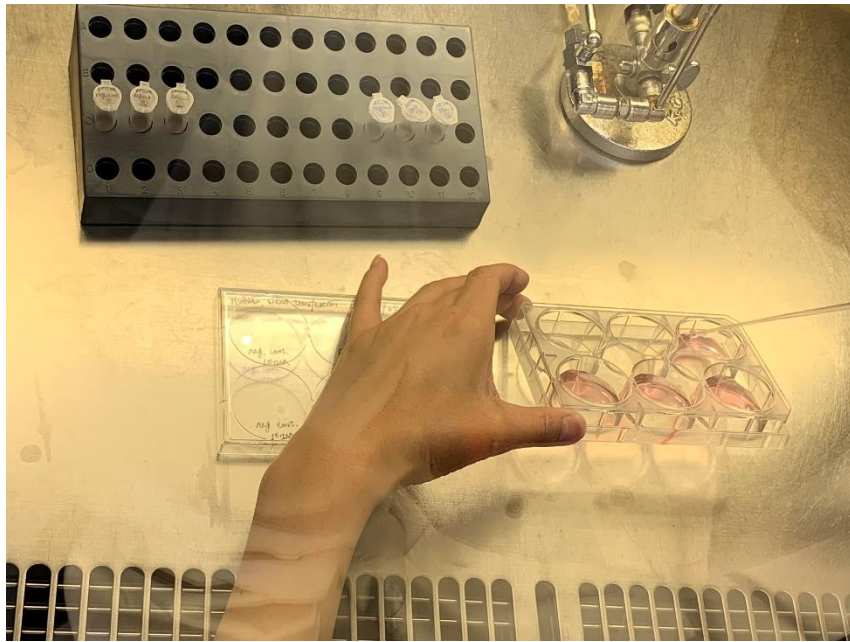
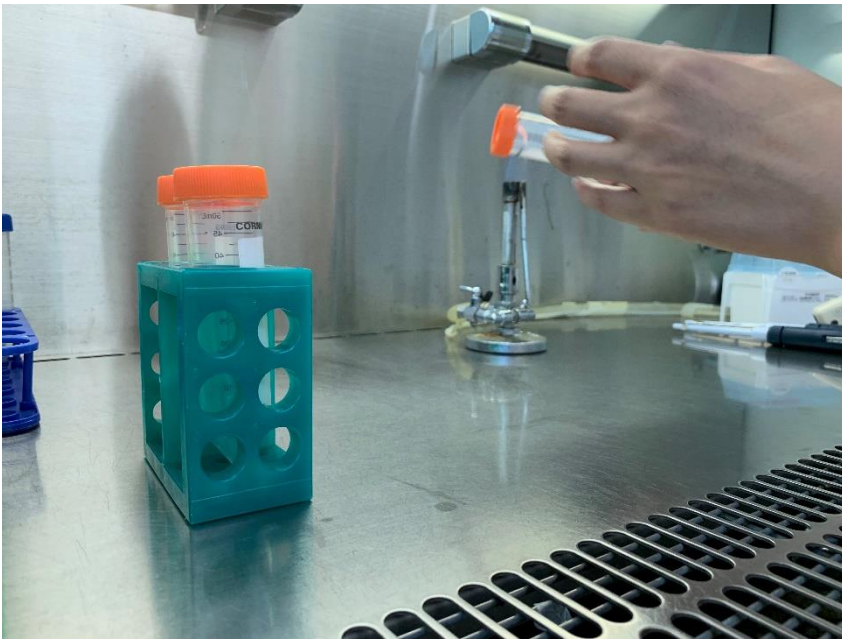
NUSDM Molecular biology department has one of the best facility for bioinformatics for

microarray of genes and micro RNAs. I saw it for the first time and even helped the researchers in evaluating the data.

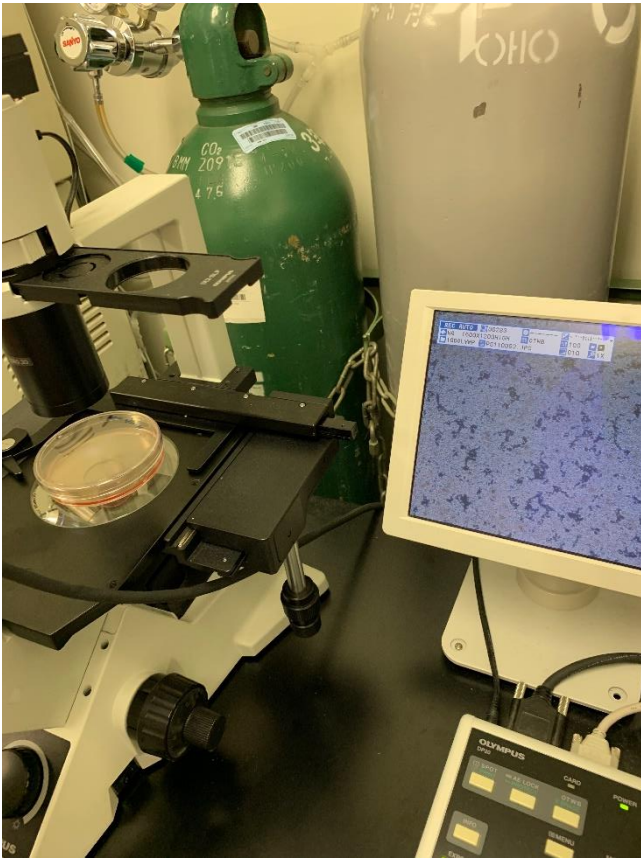
My research work:

I had submitted a research project related to dental traumatology. During my early part of stay in the NUSDM, I tried to do more literature search and plan the methodology of this project. I wanted to work upon the hypoxia of cementoblasts cells and how it affects their gene expression. This research was done for me without any cost in the molecular biology department. I worked closely with Dr Ujjal K Bhawal and Dr Xiaoyan Li to formulate the study objectives and protocols. This is an important research question because, we still do not know much about the behavior of cementoblast cells when they are subjected to hypoxic situations due to dental trauma, periodontal diseases or orthodontic tooth movements. On one hand it made me gain experience in cell culture, anerobic culture and molecular biology procedures, on the other hand, it helped me plan a research paper, which we will be submitted to a high impact journal in coming months.

In addition to this project, I also worked on other research projects being conducted in the department. I also contributed to few publications during the course of my fellowship which are under peer review in various scientific journals.



Various procedures done in cell culture room for different projects conducted during my fellowship



Various procedures done in cell culture room involving advanced molecular biology procedures during my fellowship

III. LIFE IN NUSDM:

I used to attend the regular Monday meetings of department of Anesthesiology. It was conducted in Japanese language but the professors in the department were humble enough to acknowledge my presence. I used to greet everyone “Ohayo-Gozaymasu” every morning and felt good to interact with people working in this institute. I felt so welcomed by everyone as even after a language barrier, they tried to help me.

My first taste of Japanese food was in the canteen of NUSDM. It is a huge facility open for the students and faculty members and served fresh and healthy food. I was amazed at the hygiene of the canteen and how people used to sit and interact in lunch hours. During my stay, the staff of canteen was courteous to understand my Japanese words. I had several delicacies like Hamburg, fried chicken, miso soup, soba and tempura. All the people of the department used to have lunch together which was a good experience for me.

We also had break times when we used to sit and talk about my home and culture and listen to other people. I was lucky that during my stay the department had people from China and Burundi along with the Japanese people. It was an enriching experience. In my stay, there were parties with in the institute and I came to know more about the happy work culture here.

Outside NUSDM, we went for one Shushi Party with Prof Koh Shibutani and other staff of Department of Anesthesiology and Our Lab. It was my first experience to eat raw fish and use chop sticks and I loved it. I loved the way that everyone was taking care of each other like a family. We also went to Indian Restaurant for sayonara party of the student from Burundi. It was good to introduce the Indian food to my Lab colleagues. I was happy to see many Japanese people enjoying the Indian curries.

My life here was very different from what I have in New Delhi. Here I was a learner and not a faculty and it was a new challenge to live in a new place away from home. The variation in time zones was difficult for me initially and I was late to reach the lab many

times, however, Dr Ujjal was kind to allow me to adjust. Every day as I took train from Komagome station, changed to Nippori station and then bus from Matsudo station to NUSDM, it was like a new experience and seeing more of Japanese life. Many times, I used to be the only foreigner in train and bus. I am so thankful to Japan Dental Association to allow me to live these days which are surely going to be there in my memory forever.



With my team Dr Ujjal K Bhawal, Dr Juan Du, Dr Feng Zhang, Dr Xiaoyan Li in Department of Biochemistry and Molecular Biology in Nihon University School of Dentistry at Matsudo



With Prof Koh Shibutani, Dr Ujjal K Bhawal and other faculty members & students of Department of Dental Anesthesiology and Department of Biochemistry and Molecular Biology



Different kinds of delicious Japanese foods eaten in the cafeteria of Nihon University School of Dentistry and Social gatherings

IV. LIFE OUTSIDE NUSDM:

I was quick to adjust to Japanese life. I loved every moment of my daily life. Apart from my transit to and from dental school, I took walks every evening to see and explore. I walked in Bunkyo-Ku, walked to Yanaka Market, Ueno Area and Ameyoko Market. It was great to see it all. I feel that walking like this gives you moments to see the life and places at peace. I used to do that either after working hours or on weekends. I also took JR Trains and Tokyo Metro to Shinjuku, Shibuya, Asakusa, Tokyo Station, Tokyo tower, Minato, Akihabara, Edogawa, Chiyoda, Ginza and Tokyo bay. I explored each of these areas and took very fond memories back. I tried to learn more of Japanese language, tasted many Japanese delicious foods and bought several gifts for family and friends in India.

In august I also visited the Embassy of India in Japan to celebrate the 71st Independence-day of India. It was great to see the embassy and know how Japanese Government is collaborating with Indian Government.

I also travelled outside Tokyo for three times during weekends and university holidays as I had invitations to lecture about dental traumatology in Nagasaki University and Hokkaido University and to meet Dr Mitsuhiro Tsukiboshi, past president of International Association of Dental Traumatology in Aichi. In all these visits, I took prior permission from my supervisor and Dean of NUSDM. These visits gave me another perspective of Japanese life. Nagoya was a busy place and it was my first experience to travel by Shinkasen. I met with Dr Tsukiboshi, conveyed my regards and spent whole day in his clinic. He was kind to treat me with delicious lunch of Unagi rice (Eel).

Nagasaki was one of the most beautiful places I have ever been in my life. I took flight

from Haneda airport and used public transport- Tram/Rail Car there. I met with Prof Taku Fujiwara and saw the famous tourist attractions like atomic bomb museum, peace park, harbor and china town. I also took a ferry to island of Iojima. It was a beautiful experience.

In my visit to Sapporo, Hokkaido, I took flight from Narita Airport. Professor Yatsutaka Yawaka from Hokkaido University Dental School was kind to host me. I enjoyed his company and went to the sea town of Otaru, visited the University, clock tower and museums. He gave dinner in my honor and I tasted several local delicacies like Hokke fish in my stay.

Overall the memories of Japan life and culture are very prime and will always give me happiness in years to come.



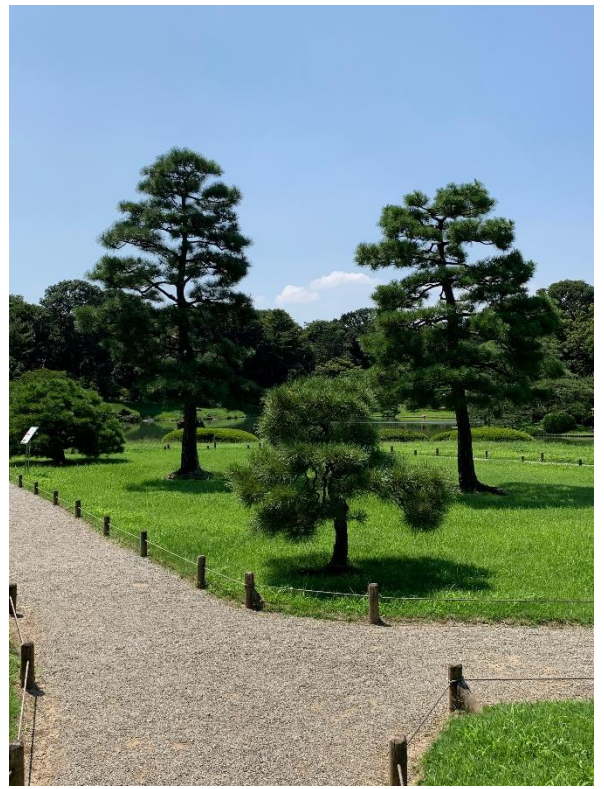
At Sensoji Temple, Asakusa



At various places in Tokyo



Celebrated Indian Independence Day at Indian Embassy in Tokyo on 15th August 2019



Rikugien Garden near Komagome Station

Nagasaki Visit



Nagoya and Hokkaido Visits



V. RESEARCH MEETINGS AND SCIENTIFIC EXCHANGES:

My first research meeting was with Dr Mitsuhiro Tsukiboshi. He is one of the biggest names in Dental Traumatology and tooth auto transplantation in the world and was president of International Association of Dental Traumatology (IADT) from 2008-10. I discussed the developments of Indian Society of Dental Traumatology and invited him for our 2nd National Conference. I also worked with him in IADT for standing committee of membership and recruitment. I discussed about future collaborations and my works in dental traumatology.

I lectured on Splinting of teeth and its clinical paradigms in Nagasaki University. This lecture was attended by about 30 students and faculty members. I presented the work I am doing during my fellowship and the past works I have done for tooth splinting. I acknowledged the role of Japan Dental Association in my lecture for selecting me for this fellowship. I also discussed the future collaborations between Nagasaki University and AIIMS, New Delhi with Vice Dean and Prof Taku Fujiwara. International Association of pediatric Dentistry had Prof Fujiwara as a board member. I talked about the status of pediatric dentistry in India and how we are working with Government of India and Indian Society of Pediatric and Preventive Dentistry for improving the oral health care of children.

I participated in annual research meeting of Nihon University School of Dentistry at Matsudo. I saw how conference is being conducted in Japan and saw the advanced researches being done in NUSDM. The language of communication was Japanese but I could understand quite a bit of research.

In Hokkaido University, I lectured on Adverse consequences of traumatic dental injuries. It was held in the Dental School and attended by about 50 dentists. I had put some Japanese subtitles in my slide to help the students understand my lecture. I also had meeting with Dean of Dental School for future collaborations.



Meeting and Scientific Exchange with Dr Mitsuhiro Tsukiboshi, Past president of International Association of Dental Traumatology at his clinic in Kanie, Acichi, Nagoya



Meeting with Prof Taku Fujiwara, Chair, Department of Pediatric Dentistry, Nagasaki University Hospital and Ex Board Member of International Association of Pediatric Dentistry



Meeting with Prof Yasutaka Yawaka, Chair, Department of Pediatric Dentistry and Disabled People, Hokkaido University Hospital and Board Member of Asian International Association of Dental Traumatology



Annual Research Conference at Nihon University School of Dentistry at Matsudo



Lecture in Hokkaido University Hospital

VI. PUBLICATIONS:

1. Bhawal U K, Li X, **Tewari N**. The wound healing of facial trauma in children. (Under publication)
2. Bhawal U K, Li X, Suzuki M, Oka T, Arikawa K, **Tewari N**, Liu Y. Treatment with low-level sodium fluoride induces wound healing and the osteogenic differentiation of bone marrow mesenchymal stem cells. Under Peer review in Dental Traumatology Journal

VI. HOW I PLAN TO USE THIS EXPERIENCE:

This fellowship has given me a newer outlook towards basic science and oral biology research. In future I shall be in better position to collaborate with advance basic sciences departments in India and add the high impact parameters in my research projects. This will not only benefit me in getting better publications in reputed journals, it will also help me in getting more funded research projects. Additionally, my experience will transpire in my post graduate and research students who will learn these basics from me. On a broader perspective, my endeavors might also motivate many of dentists in India to strive for advanced research in their career.

The strong bond which I have developed with the Department of Molecular Biology at NUSDM will enable me to plan joint Indo-Japan Oral Biology symposium at AIIMS New Delhi so that the level of research can improve. I will also try to collaborate with Dr Ujjal K Bhawal and his lab for joint research projects related to Dental Traumatology.

My interactions with Nagasaki and Hokkaido University might lead to mutually beneficial collaborations with these Universities and AIIMS New Delhi. The strong bonds and scientific exchange program between Indian and Japanese Universities will be very beneficial for Indian students and faculty members and enable the Japanese students and researchers to gain experience in a new environment.

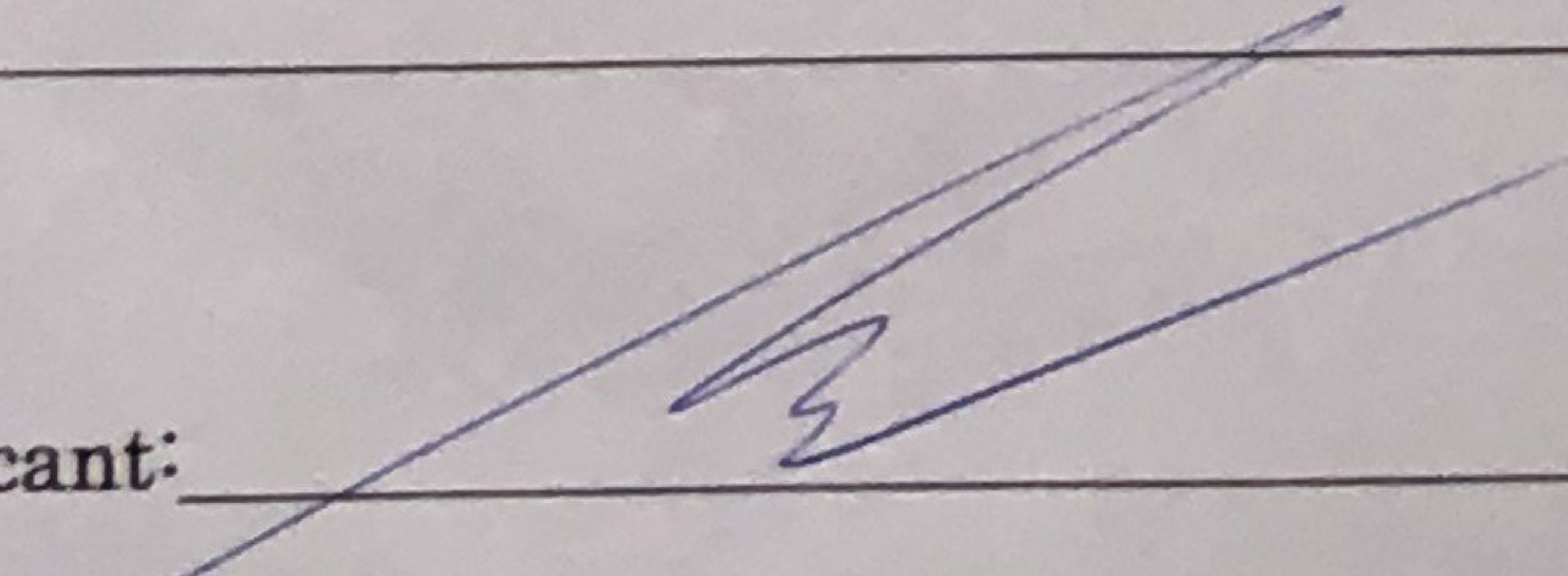
VII. CONCLUSION

As I am ending this fellowship, I am filled with gratitude towards Japan Dental Association, great people I met in Nihon University School of Dentistry at Matsudo and the people I interacted during my life in Japan. Every country is known by its people and it's an overwhelming feeling to express my affection and appreciation for Japanese people. It's a different way of life which I have seen here which gives respect to every human being and follow principles and morals. I tried to adapt to this way and felt very good. The knowledge, skill and experience I have gained in NUSDM is beyond my imagination and I feel enriched. These positive points from the Fellowship of Japan Dental Association will help me to become me a better researcher, clinician, academician and above all a better human being.



JAPAN DENTAL ASSOCIATION
 THE FELLOWSHIP OF THE INTERNATIONAL SCIENTIFIC EXCHANGE FUND
 RESEARCH ACCOMPLISHMENT REPORT

Name of Recipient: Dang Tuan Anh	Period of Fellowship: 2019/10/01 – 2020/03/31
Research Subject: N/A	
Host Institution in Japan: Department of Oral Rehabilitation and Regenerative Medicine, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences	Host Supervisor in Japan: Prof. Takuo Kuboki Chair and Professor of Department of Oral Rehabilitation and Regenerative Medicine, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences.
Accomplishments during your stay in Japan: (If this space is not enough, please attach a report) <ol style="list-style-type: none"> 1. Clinical observation: <ul style="list-style-type: none"> - Implantology: basic and advanced techniques - Fixed and partial prosthodontics, prosthodontics supported implants - Applying advanced oral 3D scan technique: for replicate the emergence profile, making provisional abutment and the final restoration in patient as well. 2. Research: experiencing the experiments in the field of molecular biology biochemistry: <ul style="list-style-type: none"> - Cell culture - Conventional PCR, Real time PCR - Immunohistochemistry (frozen section) - 3D scan, reconstruction and analysis of hard tissue (mouse femurs) 	
Publications: N/A	
Presentations at Academic Meetings: N/A	
Contact Address after the Period of this fellowship: 36/274 Lach Tray street, Ngo Quyen district, Haiphong city, Vietnam.	
E-mail Address: Tuananh.dang2309@gmail.com	

Signature of Applicant:  Date: 2020/04/05