IMRC◎2020

International Medical Student Research Conference

MOVING FORWARD
TOGETHER IN DATA SCIENCE

December 19-20, 2020

Phramongkutklao College of Medicine

The 1st International Medical Student Conference 2020

1st IMRC 2020

"Moving forward together in Data Science"

December 19-20, 2020

Phramongkutklao College of Medicine
Bangkok, Thailand

WELCOME MESSAGE

Dear all delegates,

On behalf of the organizing committee, it is my great pleasure and honor to cordially invite you to the 1st IMRC 2020, situated in the heart of Bangkok, Thailand. As a chairman of organizing committee, I would like to take this opportunity to thanks our keynote and invited speakers. Furthermore, I invite you to visit Bangkok, a cultural capital of Thailand. I proudly present you a unique culture and the many attractions of this metropolitan. Definitely, you will also enjoy delicious Thai food. I hope that the IMRC 2020 will be a memorable congress to benefit all the delegates. I look forward to warmly welcoming you to IMRC 2020.

Maj.Gen. Surasak Tanudsintum, M.D.
Dean of Phramongkutklao College of Medicine
Director of Phramongkutklao Hospital
Chairman of IMRC 2020

WELCOME MESSAGE

Dear fellow medical students,

As the organizing chairperson of the 1st International Medical Student Conference (IMRC 2020), I would like to express my whole-hearted welcome toward all those who are fascinated in our conference. I am enthusiastic to explore voluminous of your exceptional academic work, not only because they are initiated by medical students, but also because they illustrated how much our generation care toward the national and global health concerns.

Amidst global outbreak of SARS-CoV-2, it is within our deep concern for global public health situation, we decided to hold IMRC 2020 as hybrid conference, and participants can choose to participate on-site conference or join our virtual conference online at home. For onsite participation, our committee will ensure all your safety with every standard precaution possible. Reassured that we will put your wellbeing beforehand, as well as confirming that either way, you could get the most out of our conference.

I am anticipated that this conference would serve all the objectives that we endeavored. I wish you all the best and look forward to escorting all of you with our earnest hospitality during the conference.

Mr. Chatdanai Chanthowong
Fifth Year Medical Student, Phramongkutklao College of Medicine
Organizing Chairperson of IMRC 2020

CONTENT

ORGANIZING COMMITTEE
International Medical Student Research Conference (IMRC 2020)

Maj.Gen. Surasak Tanudsintum	*Dean of Phramongkutklao College of Medicine (PCM)*
	Chairman of the Organizing Committee
Maj.Gen. Asst.Prof. Chantrapa Sriswasdi	*Director of Academic Affairs Division, PCM*
	Vice-Chairman of the Organizing Committee
Col. Asst.Prof. Dusit Staworn	*Deputy Dean for Administration, PCM*
Col. Thamrongroj Temudom	*Deputy Dean for Academic Affairs, PCM*
Col. Nawaporn Hirunviwatgul	*Deputy Director of Academic Affairs Division, PCM*
Col. Prof. Mathirut Mungthin	
Col. Asst.Prof. Ram Rangsin	
Col. Asst.Prof. Panadda Hatthachote	
Col. Assoc.Prof. Suthee Panichkul	
Col. Asst.Prof. Thammanoon Srisaarn	
Col. Manop Chaimati	
Col. Amnart Chaiprasert	
Col. Asst.Prof. Phunphen Napradit	
Col. Asst.Prof. Unchalee Visawapoka	
Col. Pajaree Thitthiwong	
Col. Kitiporn Putthikhunt	
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Col. Asst.Prof. Anusara Vattanajun	
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Lt.Col. Nutchol Charoenpon	
Lt.Col. Kanista Luenam	
Lt. Pisanupong Buddhadecharad	
Lt. Jirapha Sanit	
Lt.Col. Assoc.Prof. Phunlerd Piyaraj	*Conference Secretary*
Capt. Asst.Prof. Boonsub Sakboonyarat	
Lt. Yutthana Punsuwan	
2nd Lt. Kawin Wongthamarin	

STUDENT COMMITTEE
International Medical Student Research Conference (IMRC 2020)

Chatdanai Chanthowong	*Organizing Chairperson*
Naruporn Krungkraipetch	*General Secretary*
Kanyakorn Siraprapapong	*Secretary of Academic and Program Division*
Panuwach Subbalekha	*Assistant for Secretary of Academic and Program Division*
Nachanok Sutthiopad	*Secretary of Human Resources and Supports Division*
Songpol Chatmongkolchai	*Assistant for Secretary of Human Resources and Supports Division*
Pongpak Sumeksri	*Director of Academic Program*
Saranphruk Kiengsiri	*Head of Academic Competition (Oral presentation)*
Saharat Liampeng	*Head of Academic Competition (Poster presentation)*
Anecha Somjitchob	*Head of Keynote Session*
Natthamongkol Sanganate	*Head of Broadcasting*
Teetawat Koetkhumsap	*Director of Entertaining Event*
Paphatsorn Chantarapitak	*Director of Cultural Program*
Thanagorn Vichitkijja	*Head of Palace Visit*
Sirada Wittayachanyapong	*Director of Official Event*
Supattanasak Budsuwan	*Head of Opening and Closing Ceremony*
Emmalyn Sophonphichet	*Head of Welcoming Reception*
Sirapat Prakiatpongsa	*Director of Media*
Tippadisorn Takon	*Media*
Sidaporn Wittayachanyapong	*Head of Publication*
Thanawat Yuchan	*Creative*
Apinuth Sunee	*Director of Receptionist*
Naphat Wongkliawrian	*Director of Evaluation*
Supakarn Khunsong	*Evaluation*
Theethach eamchotchawalit	*Database*
Kan Jullanate	*Website*
Puttaratep Muangsombut	*Director of Logistics*
Sarita Wilairatanaporn	*Head of Food Logistics*
Supachai Chodchoy	*Head of Venue Logistics*
Sorawit Chamnanmo	*Director of Finance*
Panissara Amornjiraporn	*Fundraiser*

CONFERENCE PROGRAM

International Medical Student Research Conference (IMRC 2020)
Venue: Phramongkutklaovejvitthaya Building, Princess Bejaratana Building

Saturday, 19 December 2020	
0800 - 0830	**Registration**
0830 - 0900	**Opening Ceremony**
0830	IMRC 2020 Video presentation
0835	**Opening remarks by** *Clinical Professor Emeritus Udom Kachintorn*
0845	**Welcome remarks by** *Professor Emeritus Avudh Srisukri,* *Secretary-General of the Consortium of Thai Medical Schools*
0850	**Welcome remarks by** *Major General Surasak Tanudsintum,* *Dean of Phramongkutklao College of Medicine*
0855	**Welcome remarks by** *Mr. Chatdanai Chanthowong,* *Student Chairperson of the Organizing Committee*
0900	Group Photo
0900 - 0945	**2020 National Medical Teacher Award Presentation Ceremony**
0910	Announcement of 2020 National Medical Teacher Award under the Consortium of Thai Medical Schools by *Dr. Prachyapan Petchuay, Chairman of the NMTA Committee*
0915	2020 National Medical Teacher Award Video presentation
0920	2020 National Medical Teacher Award presentation by *Professor Emeritus Avudh Srisukri,* *Secretary-General of the Consortium of Thai Medical Schools*
0925	**Remarks by** *the recipient of 2020 National Medical Teacher Award*
0930	Conclusion of award presentation ceremony
0945 - 1000	Break

CONFERENCE PROGRAM
International Medical Student Research Conference (IMRC 2020)
Venue: Phramongkutklaovejvitthaya Building, Princess Bejaratana Building

Saturday, 19 December 2020

1000 - 1100	**Opening keynote - Challenging future: Medicine beyond frontier** *Prof. Dr. Anan Srikiatkhachorn*
1100 - 1200	**Oral Presentation 1** • Systematic Reviews and Meta-analysis Research
1200 - 1245	**Eye opener in Data Science Research** *Capt. Ploypun Narindrarangkura, M.D.*
1245 - 1315	Lunch
1315 - 1515	**Poster Presentation 1** *(Lecture Room 1, 2)* • Community-based Research • Medical Education Research • Basic Science Research • Hospital-based Research **Oral Presentation 2** *(Main Conference Hall)* • Basic Science Research • Medical Education Research
1515 - 1530	Break
1530 - 1730	**Poster Presentation 2** *(Lecture Room 1, 2)* • Medical Education Research • Hospital-based Research **Oral Presentation 3** *(Main Conference Hall)* • Community-based Research
1730 - 1800	**Royal Phaya Thai Palace Visits**
1800 - 2030	**Welcome Reception at Roman Garden of Royal Phaya Thai Palace** (COTMES executives, Faculties, Student delegates)

* Oral Presentation: 10 mins/abstract; 7 mins presentation 3 mins Q&A

  Poster Presentation: 5 mins/abstract; 3 mins presentation 2 mins Q&A

CONFERENCE PROGRAM

International Medical Student Research Conference (IMRC 2020)
Venue: Phramongkutklaovejvitthaya Building, Princess Bejaratana Building

Sunday, 20 December 2020

0800 - 0830	Registration
0830 - 1000	**Oral Presentation 4** *(Main Conference Hall)* • **Hospital-based Research**
1000 - 1015	Break
1015 - 1215	**Oral Presentation 5** *(Main Conference Hall)* • **Hospital-based Research**
1215 - 1300	Lunch
1300 - 1345	**Panel discussion:** **Student engagement in research: Student's Perspective** • *Mr. Chatdanai Chanthowong* *5th Year Medical Cadet, Phramongkutklao College of Medicine* • *Mr. Karan Srisurapanont* *3rd Year Medical Student, Faculty of Medicine, Chiang Mai University* • *Ms. Tanaporn Jaroenngarmsamer* *6th Year Medical Student,* *Faculty of Medicine Ramathibodi Hospital, Mahidol University*
1345 - 1400	Break
1400 - 1500	**Opening keynote - New Frontier in Health informatics** *Assoc.Prof. Tiranee Achalakul, Ph.D.*
1500 - 1530	**IMRC 2020 Award Presentation and Closing Remarks** *Lieutenant General Tara Poonpracha* *Director of Phramongkutklao Medical Center*
1530	Group Photo

* *Oral Presentation: 10 mins/abstract; 7 mins presentation 3 mins Q&A*

   Poster Presentation: 5 mins/abstract; 3 mins presentation 2 mins Q&A

CONFERENCE OVERVIEW

International Medical Student Research Conference 2020 (IMRC 2020)

Host: Phramongkutklao College of Medicine and Consortium of Thai Medical Schools
Theme: Moving forward together in Data Science
Venue: Phramongkutklao College of Medicine, Bangkok, Thailand

IMRC 2020 is the international conference of medical and related health professional students' research organized by Phramongkutklao College of Medicine (PCM). The highlight of this conference is the Medical and related Health Professional Students' Research Competition (MSRC). The MSRC is a forum for undergraduate medical students as well as related health professional students to showcase their research, exchange ideas, and improve their communication skills while competing for the prestigious Her Royal Highness Princess Maha Chakri Sirindhorn trophy.

Objectives:

- To give undergraduate medical and related health professional students the opportunity to share their research ideas and results at IMRC in a special forum that provides visibility for their work,
- To give undergraduate medical and related health professional students the opportunity to meet and interact with IMRC attendees to share ideas, gain new insights, and understand possible practical applications,
- To give undergraduate medical and related health professional students an opportunity to sharpen their communication skills,
- To provide valued feedback to students about their research and presentation, from a panel of distinguished judges from Consortium of Thai Medical Schools (COTMES), and
- To recognize and reward outstanding student research.

The Medical and Related Health Professional Students' Research Competition (MSRC):

Abstract content of MSRC is reviewed by referee committee that will evaluate the work based on its overall quality, originality, and relevance to the medical fields. Abstracts are not considered to be a prior publication of the work for the purposes of a journal publication. Abstracts selection will be evaluated based on:

- Quality of work
- Novelty of approach
- Significance of the contribution to the medical field
- Clarity of written presentation
- Quality of visual and oral presentation (poster)

Confidentiality of submissions is maintained during the review process. All rejected submissions will be kept confidential in perpetuity. All submitted materials for accepted submissions will be kept confidential until the start of the conference or the release of conference abstracts during the conference, with the exception of title and author information which will be published on the website prior to the conference. Submissions should not contain sensitive, private, or proprietary information that cannot be disclosed at publication time.

Competition Overview:

There are 2 types of research competition in IMRC 2020; Oral Presentation and Poster Presentation. An abstract is considered for one of the following tracks:
1. Basic science research
2. Medical education research
3. Community-based research
4. Hospital-based research
5. Systematic review and meta-analysis research

General Rules and Regulation:

1. Documents with any form of plagiarism will be immediately disqualified.
2. Deadline for submission is to be strictly followed. Any form of action which does not follow the deadline will be disqualified.
3. All decisions made by referee committee are final.
4. Collaborative research may be admitted under the assumption of internal agreement between the authors.
5. For group researches, the presenting speakers shall be designated the primary authors for competition purposes.

Study Guidelines:

- Studies should present a significant new contribution in the biomedical, clinical and/or public health fields.
- Studies must not be previously published in a journal or currently in the process of peer review.
- The same protocol cannot be submitted for more than one competition.

Abstract Submission:

- Submission deadline: November 20, 2020
- Results announcement: November 30, 2020
- Abstract format required for abstract submission are listed below;
  a. Title
  b. Authors and Institution/organization
  c. Content
     - Introduction
     - Objective
     - Methods
     - Results
     - Conclusion
  d. Word limit is 350 words
- Selection Process: Abstracts are reviewed by 3 reviewers.

Oral Presentation:

Entry Requirements: Fill-in application form on website: pcm-imrc.com

Selection Process

- Abstracts are reviewed by 3 reviewers.
- For abstract that is not accepted for oral presentation, consideration for poster presentation will be conducted automatically.

Presentation:

- Organizing committee will contact you for submission of presentation file.
- Presentation file format: Power Point Presentation (.ppt or .pptx) / Prezi
- Presentation session will be assigned by category entry. Presentation schedule will be sent to your registered email after submitted your presentation file.
- Presentation time: 10 minutes (7 minutes for presentation, 3 minutes for question and answer)
- Warning sound: 2 times (at the 5th and 7th minute)
- Computer and LCD projector are available for on-site presenter.
- For online presenter, attending pre-conference workshop is mandatory.

Poster Presentation:

Entry Requirements: Fill-in application form on website: pcm-imrc.com

Poster format: Portrait or landscape poster of size 90 x 120 cm

   a. Title and Authors / Institution / Organization
   b. Background / Introduction
   c. Methodology / Methods
   d. Results
   e. Discussion
   f. Conclusion
   g. References (Vancouver style)
   h. Language: English (all local words or phrases should be provided with English translation)

Presentation:

- All posters will be displayed online (E-poster).
- Organizing committee will contact you for submission of presentation file.
- Presentation file format: PDF
- Presentation session will be assigned by category entry. Presentation schedule will be sent to your registered email after submitted your presentation file.
- Presentation time: 5 minutes (3 minutes for presentation, 2 minutes for question and answer)
- E-poster presentation will be conducted on LCD projector screen.
- For online presenter, attending pre-conference workshop is mandatory.

Registration:

The conference is held as hybrid conference. Please specify standard or virtual conference during registration. Standard registration will also receive access through virtual conference, hence refunding will not be available.

Registration Fee		Standard (price/person)	Virtual
Individual	Early	3,000 THB (100 USD)	1,000 THB (40 USD)
	Regular	3,500 THB (120 USD)	1,200 THB (50 USD)
	Late	4,000 THB (140 USD)	1,500 THB (60 USD)
Group (≥ 4 people)	Early	2,500 THB (80 USD)	-
	Regular	3,000 THB (100 USD)	-
	Late	3,500 THB (120 USD)	-

Introduction to IMRC 2020   **IMRC 2020 Registration**   **Abstract Submission**

Official website: https://pcm-imrc.com/
Contact email: imrc@pcm.ac.th
Facebook page: IMRC2020

AWARDS
International Medical Student Research Conference 2020 (IMRC 2020)

The best oral scientific presentation will receive:
- Her Royal Highness Princess Maha Chakri Sirindhorn's Trophy
- Scholarship of 20,000 THB
- Certificate of achievement

The winner for oral presentation of each track will receive:
- The 1st IMRC's Trophy
- Scholarship of 10,000 THB
- Certificate of achievement

The winner for poster presentation of each track will receive:
- The 1st IMRC's Trophy
- Scholarship of 7,000 THB
- Certificate of achievement

The winner for the popular vote on poster presentation from FACEBOOK will receive:
- The 1st IMRC's Trophy
- Scholarship of 5,000 THB
- Certificate of achievement

Rules for popular vote competition
- Every single Facebook Like in each photo is counted as 1 point/Like (included all emoticons).
- Every single Facebook Share is counted as 2 points/Share (not include repeated share from the same person).
- Only accepted abstracts are eligible for popular vote competition.

Honorable mention for oral and poster presentation will receive certificate of achievement according to score criteria listed below:
- Gold level   ≥ 80 %
- Silver level   70 - 79 %
- Bronze level 60 - 69 %

REFEREE COMMITTEE
International Medical Student Research Conference 2020 (IMRC 2020)

1. Asst.Prof. Dr.Kanyanatt Kanokwiroon — Faculty of Medicine, Prince of Songkla University

2. Dr. Yodying Dangprapai — Faculty of Medicine Siriraj Hospital, Mahidol University

3. Dr.Titiwat Sungkaworn — Faculty of Medicine Ramathibodi Hospital, Chakri Naruebodindra Medical Institute

4. Asst.Prof. Dr.Busaba Supawattanabodee — Faculty of Medicine Vajira Hospital, Navamindradhiraj University

5. Asst.Prof. Dr.Ittisak Subrungruang — Faculty of Medicine Vajira Hospital, Navamindradhiraj University

6. Dr.Chavanant Sumanasrethakul — Faculty of Medicine Vajira Hospital, Navamindradhiraj University

7. Asst.Prof. Chiroj Soorapanth — Faculty of Medicine Vajira Hospital, Navamindradhiraj University

8. Assoc.Prof.Maj.Gen.Sangkae Chamnanvanakij — School of Medicine, Mae Fah Luang University

9. Prof. Suthee Ratthanamongkolgul — Faculty of Medicine, Srinakharinwirot University

10. Dr.Achara Wuttiprasittipol — Panyananthaphikkhu Chonprathan Medical Center

11. Prof. Sittisak Honsawek — Faculty of Medicine, Chulalongkorn University

12. Dr.Chatchanan Doungkamchan — Faculty of Medicine, Chulalongkorn University

13. Dr.Vorapol Jaroonvanichkul — Faculty of Medicine, Chulalongkorn University

14. Prof.Emeritus Chutima Sirikulchayanonta — College of Medicine, Rangsit University

15. Prof. Dr. Lakkana Thaikruea — Faculty of Medicine, Chiang Mai University

16. Col. Prof. Mathirut Mungthin — Phramongkutklao College of Medicine

17. Col. Asst.Prof. Panadda Hatthachote — Phramongkutklao College of Medicine

18. Col. Asst.Prof. Ram Rangsin — Phramongkutklao College of Medicine

19. Lt.Col. Asst.Prof. Picha Suwannahitatorn — Phramongkutklao College of Medicine

20. Lt.Col. Kanlaya Jongcherdchootrakul — Phramongkutklao College of Medicine

21. Lt.Col. Wittawat Chantkran — Phramongkutklao College of Medicine

22. Lt.Col. Tanit Boonsiri — Phramongkutklao College of Medicine

KEYNOTE AND PLENARY SPEAKER

Clinical Professor Emeritus Udom Kachintorn, M.D.

Education / Training
- M.D., 1978, Faculty of Medicine Siriraj Hospital, Mahidol University
- Certified Board of Internal Medicine, 1984, Medical Council of Thailand
- Director Certification Program (DCP) 211/2015 Institute of Directors Association (IOD)
- Director Accreditation Program (DAP) 124/2016 Institute of Directors Association (IOD)
- Certificate Executive Program "Strategy and Innovation for Businesses in Asia (SIBA)", 2016, Massachusetts Institute of Technology (MIT) Sloan School of Management

Experience
- Chairman of the Higher Education Commission
- Deputy Minister of Education
- Dean, Faculty of Medicine Siriraj Hospital, Mahidol University

KEYNOTE AND PLENARY SPEAKER

Professor Anan Srikiatkhachorn
Dean of Faculty of Medicine, King Mongkut's Institute of Technology Ladkrabang

Education
- B.Sc. (Medical Sciences), Faculty of Medicine, Siriraj Hospital, Mahidol University
- M.D., Faculty of Medicine, Siriraj Hospital, Mahidol University
- Diplomate Board (Neurology), Faculty of Medicine, Chulalongkorn University
- Research Fellow, Institute of Neurological Sciences, University of New South Wales, Australia
- M.Sc. (Clinical Epidemiology), Faculty of Medicine, Chulalongkorn University

Academic Position: Professor (Neurosciences)

Previous Administrative Appointments
- Associate Dean for Research affairs, Faculty of Medicine, Chulalongkorn University
- General Secretary, Southeast Asian Regional Association for Medical Education (SEARAME)
- Director, WHO-SEARO Collaborating Centre for Medical Education
- Temporary advisor, WHO-SEARO
- Chairman, Examination Organizing Subcommittee, Centre for Medical Competency Assessment and Accreditation, Thai Medical Council
- Member of Research Subcommittee, International Headache Society

KEYNOTE AND PLENARY SPEAKER

Associate Professor Tiranee Achalakul, Ph.D.

Education
- Ph.D. in Computer Engineering, Syracuse University, New York, 2000
- M.S. in Computer Engineering, Syracuse University, New York, 1996
- B.E. in Computer Engineering, KMIT'L, Thailand 1991-94

Academic Working Experiences
- Assistant to President for Innovation and Partnership, King Mongkut's University of Technology Thonburi (July 2016 – present)
- Director, Big Data Experience Center, Knowledge Exchange for Innovation, King Mongkut's University of Technology Thonburi (2016 – present)
- Director, Hatch: Student Incubator, King Mongkut's University of Technology Thonburi (2016 – present)
- Associate Dean in Education Development, Faculty of Engineering, King Mongkut's University of Technology Thonburi (July 2012 – May 2016)
- Associate Professor, Department of Computer Engineering, King Mongkut's University of Technology Thonburi (February 2002 – Present)
- Director, Concurrent Algorithms and Scalable Technology (CAST), King Mongkut's University of Technology Thonburi (2002 – present)
- Management Committee, The National E-Science Infrastructure Project (2012-present)
- Director, Center of Software and Computing Innovation (Innosoft), King Mongkut's University of Technology Thonburi (2009 – 2013)
- Department Chair, Department of Computer Engineering, King Mongkut's University of Technology Thonburi (July 2008 – June 2012)

KEYNOTE AND PLENARY SPEAKER

Capt. Ploypun Narindrarangkura, M.D.

Education

2018 – Present	Ph.D. student in Health Informatics
	University of Missouri - Columbia, Columbia, Missouri, USA
2017 – 2018	M.S. in Health Informatics (MSHI)
	University of San Francisco, San Francisco, California, USA
2008 – 2014	Doctor of Medicine (M.D.)
	Phramongkutklao College of Medicine, Bangkok, Thailand

Experience

2015 – 2017	Lecturer at Military and Community Medicine Department,
	Phramongkutklao College of Medicine, Bangkok, Thailand
2014 – 2015	Internship at Fort Naresuan Hospital, Phitsanulok, Thailand

INVITED SPEAKER

Mr.Chatdanai Chanthowong
Organizing Chairperson of IMRC 2020
Fifth year Medical Cadet, Phramongkutklao College of Medicine

Mr.Karan Srisurapanont
Third year Medical Student, Faculty of Medicine, Chiang Mai University

Ms.Tanaporn Jaroenngarmsamer
Sixth year Medical Student, Faculty of Medicine Ramathibodi Hospital, Mahidol University

ABSTRACT: ORAL PRESENTATION

Basic Science Research

Medical Education Research

Community-based Research

Hospital-based Research

Systematic Review and Meta-Analysis Research

Evaluation of *Pseudomonas aeruginosa* pqs quorum Sensing Inhibitors to Serve as Anti-virulence Reagent

Chawan Kritsanaviparkporn[1], Miguel Camara[2]

[1]*Srinakharinwirot University, Thailand*
[2]*University of Nottingham, United Kingdom*

Background: To limit further antibiotic resistance in *Pseudomonas aeruginosa*, an alternative to conventional drugs is reagents that suppress virulence instead of cell viability or growth. PqsA, an important enzyme in *P. aeruginosa* quinolone signaling (pqs) system, is a novel target of inhibition.

Objectives: This study aimed to characterize new PqsA inhibitors that could permeate P. aeruginosa PAO1-L cells.

Methods: Compounds samples were anthraniloyl-AMP analogues that were virtually screened from a library of 83,000 drug-like compounds and showed successful in silico docking on previous cited crystallographic PqsA structure. PqsA protein was transformed and overexpressed in *Escherichia coli*, then was purified by affinity chromatography, anion exchange, and size exclusion chromatography. Spectrophotometric assay screened compounds samples against the isolated enzyme to evaluate on-target inhibition. Compounds with at least two replicates resulting in <80% remaining PqsA activity were selected for lux-based bioreporter assay, to explore their blockage of PqsA promoter activation, as an indicator of PAO1-L cells penetrance. In hit compounds that showed <60% average pqs transcription and no effects on growth, dose-dependent inhibition and direct interference with lux were further evaluated.

Results: The purified PqsA had a final concentration of 1.43 mg/mL with sufficient purity. 496 compounds were screened via spectrophotometry, and 24 samples were selected for lux-based bioreporter. Administration of G7-2 resulted in an 82.9% remaining PqsA activity in the spectrophotometric assay ($p < 0.001$, $n = 12$), and a reduction of PqsA promoter activation to 55.0% ($p < 0.0001$, $n = 3$) without affecting PAO1-L growth in lux-based bioreporter. Potency of G7-2 was in the micromolar range ($IC50 = 7.4$ µM), and it did not directly interfere with lux bioluminescence ($p = 0.34$) to induce false positive inhibition.

Conclusion: G7-2 is a novel PqsA inhibitor that can penetrate PAO1-L cells to minimise pqs. Its exact method of binding and effects on specific pqs virulence, such as pyocyanin and biofilm production, has yet been explored. This study provides one of the bases for a drug discovery project for G7-2 to become a useful anti-virulence reagent.

Keywords: antibiotic resistance, *Pseudomonas aeruginosa*, PqsA, anthraniloyl-AMP analogues

Quantification of Cerebrovascular Reactivity in the Human Brain

Chornapatch Suwannaraks[1], Nicholas Blockley[2]

[1]*Joint Medical Programme, Faculty of Medicine, Srinakharinwirot University, Thailand*
[2]*School of Life Sciences, Faculty of Medicine and Health Sciences,*
University of Nottingham, United Kingdom

Background: Cerebrovascular reactivity (CVR) mapping is used to measure cerebral blood flow (CBF) changes during stress. Pseudo-Continuous Arterial Spin Labelling (pCASL) can be used to produce a local CVR mapping. However, pCASL is sensitive to changes in blood velocity in the four main feeding arteries of the brain: two internal carotid (ICA) and two vertebral (VA) arteries. CBF measured by pCASL is underestimated.

Objectives: This study aimed to characterise blood velocity changes in the four arteries in young adults using phase-contrast MRI. Data acquired were used to optimise pCASL with a hypercapnic challenge. The robust CVR measurement would allow precise quantification of CBF during stress. Therefore, the underlying health conditions, which were obscured during the resting state, would be revealed. Diagnosis and access of health conditions such as severe carotid stenosis and occlusion, and Moyamoya disease had been increasingly performed using CVR mapping.

Methods: Six healthy volunteers (3 men, 3 women) aged between 20 to 30 years (mean ± SD: 23.8 ± 2.6) were recruited. Each participant was scanned by phase-contrast MRI during different end-tidal partial pressure of CO_2 (PETCO2). Image and statistical analyses were performed through Fiji and Microsoft Office Excel 2019, respectively. Two-tailed Student's t-distribution test was performed to observe a linear relationship between mean blood velocities and mean PETCO2 in each artery. Two-tailed paired t-tests were performed to observe differences in mean blood velocities between ICAs and VAs during the resting state, and in mean blood velocity changes with PETCO2 between ICAs and VAs during reactivity. Mean values in the participant group were calculated.

Results: Linear relationships were detected in the left ICA, left VA, and right VA ($p < 0.05$). There was no correlation in the right ICA ($p = 0.126$). During the resting state, mean blood velocities differed between ICAs and VAs ($p < 0.05$). During reactivity, changes in mean blood velocity with PETCO2 differed between ICAs and VAs ($p < 0.05$).

Conclusion: Linear correlations between mean blood velocities and mean PETCO2 were observed in the left ICA and both VAs. The results suggested that blood velocities in the ICAs were higher than the VAs during both resting state and change.

Keywords: cerebrovascular reactivity, cerebral blood flow, Pseudo-Continuous Arterial Spin Labelling

In Silico Screening of Thai Herbal Medicines to Inhibit SARS-Cov-2 Targeting Papain-like Protease and 3-Chymotrypsin-like Protease

Nasreen Hayeeyusoh, Thanyamon Ananjamrern, Penporn Sujiwattanarat

Princess of Naradhiwas University, Thailand

Background: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a viral respiratory disease, COVID-19. It is a pandemic that affect most country worldwide and cause an infection and fatality in many country. Nevertheless there have neither vaccine nor drug approved that effectively treated COVID-19 without side effect. In silico study of the SARS-CoV-2 inhibition, the 3-chymotrypsin-like protease (3CLpro) and Papain-like protease (PLpro) are important targets of inhibitor drug. Because these two proteases are a significant protease in the SARS-CoV-2 replication.

Objectives: This study aimed to select the natural compounds from Thai herbs as inhibitor candidates for inhibiting two vital SARS-CoV-2 protease by molecular docking technique.

Methods: The crystal structure of 3CLpro and PLpro were downloaded from Protein data bank (PDB). The inhibitor candidates were selected from Thai herbal medicines containing property of antiviral activity against SARS-CoV and MERS-CoV. The protease and selected inhibitors were simulated in molecular docking program, Autodock 4.2 and Discovery studio. A remdesivir which is the drug treated COVID-19 was used to be a positive control.

Results: Molecular docking analysis revealed that the interaction between protease with beta-sitosterols, lupinifolin, andrographolide, and lignan have lowest binding energy compared with other natural compounds (-10.53, -9.59, -9.13, and -8.48 kcal/mol to CLpro and -8.36, -6.61, -6.78, -5.58 kcal/mol to PLpro, respectively). Especially, beta-sitosterols, lupinifolin, andrographolide, and lignan have the estimated binding energy lower than remdesivir against both 3CLpro and PLpro, which have been scored -8.27 and -4.35 kcal/mol respectively. Moreover, andrographolide and lignan were formed hydrogen and sulfide bond which are strong interaction with conserve amino acid in active site of 3CLpro and PLpro.

Conclusion: Thus, these four natural compounds may have the potential to SARS-CoV-2 inhibition by blocking 3CLpro and PLpro at catalytic site by considering from lowest binding energy and molecular interaction.

Keywords: SARS-CoV-2, Thai herbal medicines, Molecular docking, 3-Chymotrypsin-like protease, Papain-like protease

Maintenance of a Mesenchymal Niche in Breast Cancer PDX Model

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Background: There is a growing recognition of the importance of the tumour microenvironment in determining biological characteristics of cancer cells, and the effect of stromal components on tumour progression and drug resistance. The development of potential therapeutic agents using preclinical cancer models is restricted by the scarcity of in vivo models that can accurately represent the heterogeneity seen in the patient's tumour, both in terms of cancer cells and their microenvironment. In an attempt to avoid these issues, a more advanced generation of preclinical models, known as patient-derived xenograft (PDX) was introduced alongside genetically engineered mouse.

Objectives: This study examined the characteristics, distribution and changes of the stroma in the close-to-patient model, known as Patient-derived xenograft (PDX), in comparison with the primary tumour.

Results: This study reported a reduction of both the stroma and α-SMA expression in PDXs compared with the primary tissue. However, a consistent proportion of α-SMA in the stroma was detected in all PDXs and primary tissues. Even though no expression of FSP-1 and FAP was visualised in the stroma, the result showed FSP-1 expression on the cancer cell surface in PDX tissues. This study also reported a significant correlation between the stroma to cancer cells ratio and necrosis; but not in α-SMA to cancer ratio and necrosis. This study found no changes in terms of the stroma, α-SMA expression and necrosis in PDXs with the co-engraftment of human MSCs. Additionally, in situ hybridization using a luciferase probe revealed presence of human MSCs in PDX tissues.

Conclusion: Altogether, the PDX tissue examined in this study, to a certain degree, was able to reflect the complexity seen in the stromal compartment of primary tumours.

Keywords: patient-derived xenograft, tumour microenvironment, alpha-smooth muscle actin, fibroblast specific protein, human mesenchymal stem cells

The Role of BAIAP2L1 in Cancer Cell Invasion

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Background: Brain-specific angiogenesis inhibitor 1 (BAI1)-associated protein 2-like (BAIAP2L1), also known as insulin receptor tyrosine kinase substrate (IRTKS), is identified as a potential novel oncogene. Overexpression of BAIAP2L1 is observed in several human tumors including breast cancer. It is proved that BAIAP2L1 augmented anchorage independent growth, increased colony formation by cancer cells and strongly enhanced the ability of cells to form tumors in vivo. In addition, BAIAP2L1 promoted hepatocellular carcinoma cell line proliferation by enhancing EGFR-ERK signaling pathway. However, its role in cancer cell invasion has not been investigated.

Objectives: This study aimed to investigate the role of BAIAP2L1 in cancer cell invasion.

Methods: Transwell invasion assay was used to analyze the role of BAIAP2L1 in invasion of human breast cancer cell line MCF7. Forced overexpression and knockdown of BAIAP2L1 were obtained by pFLAG-CMV-BAIAP2L1 transfection and lentiviral-mediated BAIAP2L1-short hairpin RNA transfection, respectively. Expression of BAIAP2L1 was determined by Western blot.

Results: The result showed that knockdown of BAIAP2L1 significantly decreased invasion ability of MCF7 cells. On the other hand, overexpression of BAIAP2L1 showed no difference from control group.

Conclusion: These findings indicated that BAIAP2L1 was essential for human breast cancer cell MCF7 invasion.

Keywords: BAIAP2L1, cancer cell invasion, breast cancer, transfection

Identification of Bacteriocins Active against *Clostridium difficile*

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Background: *Clostridium difficile* is the most prevalent cause of nosocomial, antibiotic-associated diarrhoea with potential to engender severe gastrointestinal illnesses. Antibiotics reserved for treatment of *C. difficile* infection (CDI) are problematic due to their lack of *C. difficile* selectivity, warranting a search for alternative therapies. Bacteriocins, bacterially synthesized antimicrobial peptides, have been proposed as viable alternatives to antibiotics for treatment of enteric bacterial infections.

Objectives: This study aimed to isolate and characterize novel bacteriocins with activity against clinically relevant strains of *C. difficile* from environmental samples.

Methods: Sewage and faecal samples were screened for bacterial colonies with inhibitory activity against *C. difficile* strain 630. Isolates with activity were identified via 16S rRNA sequencing and further tested against R20291, DH1916, and EK27 strains. PCR was performed to assess whether the isolates encode known bacteriocins. The isolates' supernatants were assessed for activity and inhibition potency via spot and biological assays and were then concentrated using concentrating columns. Concentrated supernatants showing activity were treated with proteinase K to assess their proteinaceous properties. Proteins in the concentrated supernatants were separated using SDS PAGE to identify those that might be responsible for activity.

Results: Eleven isolates exhibiting activity against *C. difficile* to various extents were isolated. Among them, a colony of Bacillus velezensis encoding amylocyclicin exhibited greatest activity against all indicator strains tested. The isolate produced and secreted a potent inhibitory compound that had proteinaceous properties. The inhibitory compound was shown to be a protein within the 4.6 to 10 kDa size range.

Conclusion: This study has isolated and preliminarily characterized putative bacteriocin compounds showing efficacy against several clinical *C. difficile* isolates. With further characterization, these compounds may have potential as treatments for CDI. Hence, bacteriocins represent potential therapeutic options for treatment of bacterial infections, but further research is requisite to assess their applicability to cases of CDI.

Keywords: *Clostridium difficile*, bacteriocins

Devising a New Assay for the Assessment of Structural Changes of AgrA, a Virulence Regulator in the agr quorum Sensing System of *S. aureus*

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Background: *Staphylococcus aureus* is a gram-positive human pathogen that has developed resistance to almost all currently available antibiotics. Studies have shown that the virulence of *S. aureus* is controlled by the agr quorum sensing (QS) system. Many current researches have been focusing on the development of small molecule inhibitors of the AgrA protein, a virulence regulator in the agr QS system of *S. aureus*. Certain newly developed small molecules, such as savarin and ω-hydroxyemodin, were found to inhibit AgrA protein by binding to its DNA-binding domain. Previous studies have shown the effectiveness of certain small molecules in inhibiting *S. aureus* virulence and how they bind to the AgrA protein.

Objectives: This project aimed to devise a new assay which would allow the assessment of the structural changes of AgrA through utilising the native fluorescence of tryptophan amino acid.

Methods: Mutations were introduced into the AgrA gene utilizing site-directed mutagenesis (SDMs), changing tyrosine (Tyr) to tryptophan (Trp). Biological reporters were then constructed to assess the function of the mutated AgrA proteins in vivo. The mutant and wild-type proteins were subsequently expressed and purified for use as samples in the in vitro fluorescence assays. DNAs were added to the proteins and the changes in fluorescence were observed and analysed.

Results: In vivo assays suggested that the two Trp mutants behave similarly to wild-type AgrA protein. Fluorescence assays have been successful and have shown that the Trp mutations can report changes in AgrA structure when binding to DNA.

Conclusion: Changes in fluorescence emission spectra from the Tryptophans report changes in AgrA conformation. These fluorescence assays could be used to test the binding of small molecule inhibitors to AgrA. It could also potentially be used to assess effects of phosphorylation on AgrA conformation, which could lead to new discoveries of inhibitors of phosphorylation. Fluorescence polarization could also be applied to these assays in the future

Keywords: *Staphylococcus aureus*, AgrA, tryptophan

E-learning Experiences and Characteristics of Medical Students at Chulalongkorn University

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Background: E-learning emerges as a viable alternative to supplement and support conventional lecture-based learning. Preference and characteristics of E-learning's medical students could be used to transform the E-learning system.

Objectives: to evaluate medical students' perception and characteristics of using an e-learning resource.

Methods: We designed a descriptive cross-sectional study using an online survey. Participants were 249 medical students completing their first semester of first year medical students as part of a six-year degree at the Faculty of Medicine, Chulalongkorn University. Participants completed a 25-question anonymous online survey after using the E-learning resource.

Results: The study showed that the most important objective for E-learning was to catch up to their learning in conventional classrooms (59.4%). The most common E-learning problem of the students is repetitive behavior of watching (49.2%) and self-control in their learning (37.3%). 93% of the students strongly agreed that E-learning was essential for reviewing their notes after class. 61.4% of the students disagreed that E-learning could discourage professor's intention to teach(34.5% is Strongly disagree, 26.9% is disagree). E-learning could accommodate the learner's need in traditional learning because of timing preference (66.7%), flexibility and convenience (80.3%), ease of access (71.5%), respectively. 43.4% of the students strongly agreed that E-learning made them more focus on the learning materials. 64.2% of the students strongly disagreed that E-learning could substitute the conventional learning. We observed that 10 (77%) student who obtained F (13 students) grade had begun E-learning in 0.5-1 month before the examination. 6 (85.7%) students who awarded a D on the subject had start E-learning 0.5-1 month before the examination which show shorter duration than student who attain better grade. More than 70% of student watch E-learning only 1 time per lecture in every grade student. Our study suggested that minimum attendant in the class and attendant score could motivate students to participate in the classroom.

Conclusion: This study supports that the e-learning resource could be useful and effective. The combination of lectures with E-learning would be more beneficial than conventional lecture alone and early E-learning could prove to be useful in poor grade students.

Keywords: E-learning, medical student, perspective, characteristics

Satisfaction and Factors related to 4th and 5th Year Medical Students on Online Lectures during COVID-19 Situation in Khon Kaen University in Year 2020

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Background: COVID-19 pandemic situation in Thailand affects all classes to be online classes completely.

Objectives: The objective of this study was to assess the proportion of the fourth-to fifth-year medical students at Khon Kaen University who expressed satisfaction with online class and to explore factors that influence student satisfaction to improve learning style in the future.

Methods: Descriptive study which studied 506 fourth and fifth-year medical students was conducted for 305 systematic sampling students in academic year. The questionnaire was online self-answering. Data was analyzed and presented in proportions, frequency, percentage, odds ratio and 95% confidence interval.

Results: Response rate was 95.7%, approximately 74.2% (95% CI; 68.91, 78.91) of the participants were satisfied overall with online learning they studied. Factors related to participants' satisfaction of online learning such as the privacy of instructor's place OR 5.39; (95%CI; 1.89, 15.38), the appropriateness of online learning method OR 4.30 (95%CI; 2.17, 8.54) and synchronous online- based learning OR 3.41; (95%CI; 1.96, 5.92).

Conclusion: Three-Fourths of fourth and fifth-year medical students were satisfied overall with online learning and factors related to participants satisfaction of online learning such as the privacy of instructor's place, the appropriateness of online learning method and synchronous online- based learning.

Keywords: Satisfaction, online learning, medical students, Khon Kaen University, COVID-19

Quality of Life, Association Factors and Comparison between Second and Third Year Medical Cadet at the Phramongkutklao College of Medicine, 2019

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Background: Quality of life (QoL) is an essential component of learning and has strong links with the practice and study of medicine. During the process of their education, medical students learn to attend to the QoL of their patients. There are many differences in 2nd and 3rd year medical cadets QoL due to difference level in responsibility and military training.

Objectives: This study was to evaluate QoL of 2nd and 3rd year medical cadets in Phramongkutklao College of Medicine.

Methods: A cross-sectional survey was conducted in October 2019. We using the Thai version of the World Health Organization Quality of Life Instrument (WHOQOL - BREF - THAI) to assess psychological well-being, physical health, social relationships and environmental conditions of Medical cadets.

Results: We have 100% responded rate, 195 medical cadets enrolled into the study. In general, 29.74% of the students described their QoL as "good", 62.56% as "average", and only 7.69% felt it was "poor". With regard to QoL domains were reported by study students at good level were as the following; 45.13% in social relationships domain, 24.10% in psychological domain, 22.56% in physical health domain and 23.74% in environment domain. More than 4 hours sleeping time sleeping time per day was significantly associated with good QoL among medical cadets (odds ratio = 16.79, 95% confidence interval, 3.32-84.83). We also found that sufficient self-study time associated with good QoL (odds ratio = 4.01, 95% confidence interval, 1.50-10.67). To be female cadets associated with not having good QoL (odds ratio = 0.29, 95% confidence interval, 0.12-0.69).

Conclusion: Future doctors with a low QoL may translate into their poorer performance, impairing patient care. Sleeping time and sufficient self-study time is associated with overall good QoL. Finding other factors that correlated with poor QoL is important. Further study for evaluating QoL in medical cadets is recommended.

Keywords: quality of life, medical cadet

The 21st Century Skills and Voluntary Community Services among Medical Cadets, Phramongkutklao College of Medicine

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Background: Medicine is a service-oriented profession which requires professional attitudes and a sense of empathy and caring. Participation in voluntary community service (VCS) among medical students is associated with numerous positive outcomes that essential for the 21st century skills, such as promoting empathy, enhancing leadership qualities, good collaboration, social responsibility and ease in communication.

Objectives: This study aimed to examine the motivations and obstacles among medical cadets in Phramongkutklao College of Medicine (PCM) from participating in VCS.

Methods: This cross-sectional study was conducted among medical cadets at PCM in October 2019. An anonymous online survey was designed to assess demographic data, perceptions, motivations and obstacles towards com VCS activity.

Results: Of 600 students enrolled in the 2019 academic year, 197 (32.8%) responded the online survey, where males constituted (60.9%). Of these, 63.4% had participated in VCS while 80.2% expressed their interest in participating in these activities in the medical school. Motivations to participate in VCS include past-positive VCS experience and compassion. Students reported higher empathy levels, improved communication, organization, decision-making, interpersonal, and leadership skills. In the other hands, the obstacles include difficulties in recruiting and managing volunteers and attaining recognition for the project to acquire funding and resources.

Conclusion: Beyond the command of knowledge and facts the core competencies for medical students in 21st century must include social and emotional skills such as empathy, leadership, communication, collaboration. Participating in VCS in medical school enriches medical students by bringing about improved self-reported outcomes, leadership skills, and interpersonal skill

Keywords: the 21st century skill, voluntary community service, motivation, obstacles

Factors Affecting Medical Students Burnout

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Background: Because of burnout epidemic among medical students and professionals, attempts to alleviate burnout is intensified. According to the JD-R model, burnout is mainly predicted by high job-demands and lack of job-resources. At Ramathibodi Medical School, a new mentoring program has been launched for second-year students aimed at promoting social support/community, self-development, and a culture of respect and appreciation.

Objectives: This study aimed to explore the following question: Which factors of the new mentoring program do medical students perceive as having an impact on their stress/burnout and motivation?

Methods: This is the second-phase of an explanatory mixed-methods study. The first-phase was a quantitative study to identify burnout levels using the Maslach Burnout Inventory (MBI). The second-phase involves a qualitative approach. Eighteen participants with highest levels of burnout identified at the first-phase were individually interviewed. Content analysis of the interview transcriptions were independently analyzed by the authors, followed by consensus meetings.

Results: Factors in the mentoring program students perceived as helping to alleviate burnout were: a) fun and relaxing atmosphere of the activities, b) peer/group interaction with shared feeling/experiences and support, c) mentor's advice and support, d) mentor as a role model. Major activities students perceived to improve motivation were: patient/clinical-exposure experiences and mentor's retreat sessions. These activities improve students' motivation by: creating connection from classes to real-life clinical experiences, providing empathetic and dedicated physician/mentor role models, and improving students' self-efficacy. Factors hindering students' motivation were: competing priorities of tasks (e.g. examination), lack of mentor's contact-time and engagement, the gap-generation (made it difficult to build rapport with the students) and failing to create a safe space for group sessions.

Conclusion: The interventions pointed towards a decrease in burnout and improved motivation, through three main paths: a) increase the value of the learning activities and professional work, b) improve students' self-management (self-efficacy, time-management and emotional regulation), c) improve the sense of community/belongingness. Burnout and motivation interventions should be addressed on these two domains: a improving students' and mentor's engagement, b) creating a safe environment for group interaction.

Keywords: burnout, medical students, motivation, intervention

A 12-year Trend of Heatstroke among the Royal Thai Army Recruits in Basic Training

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Background: Climate change has become more interesting because of its impact to incidence and severity of heatstroke. In Thailand, there have been were new cases of heatstroke in the Royal Thai Army (RTA) basic training every year. However, there is no study showing the long-termed relationship between morbidity and the case fatality rate among recruits.

Objectives: This study aimed to determine the trend of heatstroke among the RTA recruits during the basic training between 2004 and 2015.

Methods: Descriptive data of the incidence of heatstroke in RTA from 802,224 recruits in each divisions and regions and the temperature were obtained from Territorial Defense Command and Meteorological Department of Thailand, data during 2004 to 2015. The information were analyzed for 2 important parameters: morbidity (the number of individuals that become ill due to a specific within a susceptible population during a specific time interval) and the case fatality rate (Measure of the severity of a disease which defined as the proportion of cases of a specified disease or condition which are fatal within a specified time).

Results: In the last 12 years, among 802,224 the RTA recruits, there were 134 cases admitted with heatstroke, 125 cases came from the first division and 9 cases were from second division. However, fatality cases, that was 21 cases, were belonged to the 1st basic training. Moreover, the trend of morbidity rate over 12 years has been increased slightly while the fatality rate has been decreased.

Conclusion: The trends of morbidity and mortality rates were significantly correlated with the differences of temperature. In the year that had high temperature, the rate of heatstroke was increased significantly. However, the highest-temperate region did not show the highest incident of heatstroke. Temperature is the major caused of heatstroke, however, it can be prevented.

Keywords: heat stroke, prevalence, recruits, basic training

Cyber-bullying Perpetrator and Victimization among Adolescents: Prevalence and Associated Factors in Population-based Sample of Secondary School Students in Rural Community of Thailand

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Background: Cyber bullying is misbehavior by using electronic communication technologies to bully the others. Nowadays, it has been a serious global problem. However, the study of cyber bullying in Thailand is still limited.

Objectives: The objective of the study was to determine the prevalence and associated factors of cyber bullying perpetrator and cyber victimization among secondary school in Chachoengsao Province, Thailand.

Methods: A cross-sectional study was performed during December 2017 to January 2018. Students were completed a standardized questionnaire on their activities. Multivariable logistic regression analysis was used to identify potential risk factors for Cyber bullying perpetrator and cyber victimization.

Results: A total of 4,928 secondary school students were enrolled into the study. Of those 1,080 (21.9%) reported as being cyber victimization, 857 (17.4%) reported as being cyber perpetrator and 655 (13.3%) reported as being dual cyber perpetrator and victimization. Cyber perpetrators and cyber victims were more likely to be males, failed to exam, smoke, alcohol drinking, school absenteeism and school bully. Cyber perpetrators was significantly associated with not living with parents (OR = 1.52), internet addiction (OR = 1.44), online sex seeking (OR = 1.68), traditional victimization (OR = 1.84), traditional perpetrator (OR = 3.63), alcohol drinking (OR = 1.53), school absenteeism (OR = 1.21), mild stress (OR = 1.33), moderate to severe stress (OR = 1.56) and sleeping duration less than 8 hours (OR = 1.27) after controlling for gender and failed to exam. Cyber perpetrators was significantly associated with not living with parents (OR = 1.40), internet addiction (OR = 1.38), online sex seeking (OR = 1.68), traditional victimization (OR = 2.80), traditional perpetrator (OR = 1.68), alcohol drinking (OR = 1.58), school absenteeism (OR = 1.19), mild stress (OR = 1.23), moderate to severe stress (OR = 1.65), smoking (OR = 1.27) and suicidal idea (OR = 1.57) after controlling for gender and failed to exam.

Conclusion: This study found that the high prevalence of both cyber perpetrator and victimization among secondary school students in rural community of Thailand. It is found to associate with various risky behaviors and traditional school bullying. Given the greater risk and unique challenges experienced by youth in rural community, prevention and intervention programs may need to be tailored to their specific needs and circumstances. Further research is needed to understand the specific factors and mechanisms involved in bullying victimization among immigrant youth.

Keywords: cyber bullying, school children, prevalence, associated factors

Effectiveness of DSPM Family-Mediated Preschool Parenting Program in Maetum Subdistrict, Phayamengrai District, Chiang Rai Province

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Background: Early childhood is a life stage in which brain development and learning are fast. Therefore, taking care of early childhood is very important. Developmental Surveillance and Promotion Manual (DSPM) Family-Mediated Preschool Parenting Program is applied to enable the development of children in the physical, mental, and emotional.

Objectives: This study aimed to evaluate the effectiveness of DSPM Family-Mediated Preschool Parenting Program on Emotional Quotient of early childhood.

Methods: This study was a retrospective cohort study by collecting data from early childhood between 3-6 years old at child development centers and schools in Maetum Sub-district, Phayamengrai District, Chiang Rai Province who participated in DSPM Family-Mediated Preschool Parenting Program during February 1 to May 31 2020. There were 30 people in this study. The data was obtained from Phayamengrai medical records which consist of EQ assessment form and questionnaires consist of general information, behaviors of improving emotional quotient and reinforce positive discipline in parents.

Results: The results revealed that after participating in the program, 1) The early childhood have a mean of emotional quotient significantly higher than before participating in the program (mean = 50.20, S.D. = 3.44, $p<0.001$); 2) The level of emotional quotient is at a normal or more level for all 30 people. They are 100% significantly higher than before participating in the program ($p<0.001$); 3) The emotional quotient scores increase approximately 7.83 points significantly higher than before participating in the program ($p<0.001$).

Conclusion: The DSPM Family-Mediated Preschool Parenting Program has the effect on increasing the emotional quotient of the early childhood. Parents should promote development and reinforce positive discipline of early childhood regularly and continuously.

Keywords: Early childhood, development, reinforce positive to improve discipline, Emotional Quotient (EQ)

Prevalence and Associated Factors of Left Ventricular Hypertrophy in a Rural Community, Central Thailand

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Background: Left Ventricular Hypertrophy (LVH) is a serious condition with life-threatening complications. The detected LVH is able to be a strong predictor of cardiovascular diseases and death. In Thailand, most of the information related to this issue is collected by hospitals or hospital-based organizations rather than at the community level.

Objectives: To determine prevalence and associated factors of left ventricular hypertrophy in a rural community, central Thailand

Methods: This was a cross-sectional study conducted in Na-Yao and Phra-Pleong rural communities of Thailand in 2020 using the total design method. In all, 648 individuals aged ≥ 20 years were interviewed using structured questionnaires related to demographic information, higher risk behavior, comorbidities and arthrometric measurement. LVH was interpreted by Sokolov-Lyon and Cornell criteria based on the collected electrocardiography

Results: The prevalence of LVH among adults was 6.6%. Univariate and multivariate logistic regression analysis were performed to determine the factors associated with LVH. After adjusting for the potential confounders, the risk factors associated with LVH were being male (AORs = 2.04; 95%CI, 1.05-3.98), history of diabetes mellitus (AORs = 1.01; 95%CI, 1.01-1.02), and hypertensive crisis ≥ 180/110 mmHg (AORs = 7.24; 95%CI, 1.31-39.92). However resting heart rate was negatively associated with LVH ($p < 0.05$).

Conclusion: Our data emphasized that LVH was one of the significant health problems among adults in a rural community. Effective public health interventions should be provided at the community level to reduce blood pressure, especially in male. Moreover, modifiable risk factors for diabetes mellitus and hypertension should be attenuated to inhibit the progression of cardiovascular diseases and their complication.

Keywords: Left ventricular hypertrophy, hypertensive crisis, risk factors, rural community, Thailand

Prevalence and Risk Factors of Chronic Obstructive Pulmonary Disease among Agriculturists in a Rural Community, Central Thailand

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Background: Projections of global COPD mortality in 2030 involved approximately 7.4% of total deaths making it the fourth leading cause of death2 Agricultural workers can be expose to biochemical, organic and inorganic substances which may contribute to COPD, for instance, dust, biomass smoke, ammonia, silica and endotoxins. The present study aimed to determine the prevalence and risk factors of Chronic Obstructive Pulmonary Disease (COPD) among agriculturists in a remote rural community in central Thailand.

Objectives: The present study aimed to determine the prevalence and risk factors of chronic obstructive pulmonary disease (COPD) among agriculturists in a remote rural community in central Thailand.

Methods: A cross-sectional study was conducted in January 2020. Face-to-face interviews were conducted using standardized questionnaires to determine demographic characteristics and risk behaviors. COPD was defined by the spirometric criterion for airflow limitation constituting a postbronchodilator fixed ratio of FEV1/FVC <0.70 following the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines 2019. Multivariable logistic regression analysis was used to determine the risk factors for COPD, and the magnitude of association was presented as adjusted odds ratio (AOR) with 95% confidence interval (95%CI).

Results: A total of 546 agriculturists were enrolled in the study. The overall prevalence of COPD was 5.5% (95%CI, 3.6-7.4). The prevalence of COPD among males was 8.0% (95%CI, 4.7-11.3), and 3.2% (95%CI, 1.1-5.2) among females. The risk factors of COPD included age ≥ 60 years old (AOR = 2.7; 95%CI, 1.1-7.0), higher intensity of smoking (AOR = 1.1; 95%CI, 1.0-1.1), swine farm worker (AOR = 4.1; 95%CI, 1.7-10.3), cattle farm worker (AOR = 3.3; 95%CI, 1.4-8.2) and home cooking (AOR = 2.7; 95%CI, 0.8-9.7).

Conclusion: Our data emphasized that COPD was one of the significant health problems among agriculturists in a rural community. Effective public health interventions, especially, modifying risk behaviors, should be promoted in remote rural areas to prevent the disease and reduce its morbidity and mortality.

Keywords: COPD, farmers, swine, cattle, smoking

Effectiveness of a Multi-component Community-based Hypertensive Management Intervention in a Rural Community, Thailand: a Cluster-Randomized Control Trial

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Background: Hypertension is one of the major non-communicable diseases, of which, mortality and morbidity continues increasing globally. Despite many proven effective interventions, uncontrolled hypertension remains a major problem. Only countable amount of studies used combination of intervention, which suggest success in controlling hypertension among Thai rural community area.

Objectives: This study aimed to evaluate the effectiveness of multi-component community-based hypertensive management intervention in rural community, Thailand. In addition, the abilities of multi-component intervention in other aspects including medication adherence and decreasing of body mass index were evaluated.

Methods: A cluster-randomised control trial was conducted among 150 individuals with hypertension in a rural community, Thailand. Participants were recruited from 8 villages of Ban Naa Ngam and Ban Naa Yao, Sanam Chai Khet District, Chacheongsoa, Thailand. Four villages were allocated to intervention and control groups. Primary outcome, i.e., changes in systolic and diastolic blood pressure was determined at 3- and 6-months post-intervention. In addition to that, secondary outcomes including changes in Thai 10-year cardiovascular risk score, changes of body mass index and waist circumference were also collected. Protocol of this study was reviewed and approved by the Institutional Review Board of the Royal Thai Army Medical Department.

Results: Allocated groups successfully completed follow-up at 2 months. However, 11 participants (7.33%) failed to complete the follow-up and 8 participants (5.33%) provided incomplete data, hence, they were not included in data analysis. The study illustrated changes of systolic blood pressure of -11.1 mmHg (95%CI, -11.8 to -10.6) between two groups. Moreover, changes of Thai 10-year cardiovascular risk score was also observed, reductions of 6.4% (95%CI, -8·00 to -4·80) and 11.7% (95%CI, -12.88 to -9.47) were demonstrated in control and intervention groups, respectively.

Conclusion: A comprehensive multicomponent community-based strategy of care involving all aspect of prevention of hypertension substantially reduced blood pressure and cardiovascular disease risk score. The intervention is effective, pragmatic, and has the potential to substantially reduce cardiovascular disease.

Keywords: Hypertension, Multi-component intervention, Effectiveness, Cardiovascular diseases, Community-based

The Impact of Social Media Misused and Behavior Problems among Adolescent in Central Region, Thailand

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Background: Recent increase in the prevalence of behavioral problems among young adults has coincided with the raised of popularity of Internet usage including handheld technologies, electronic game and social media among adolescent. However, these information in Thailand is limited. Therefore, this study aimed to investigate the association between social media misused and behavioral problems among adolescent in Thailand.

Objectives: To determine the prevalence and associated factor of the behavior problems among adolescent in central region, Thailand by using The Strength and Difficulties Questionnaire (SDQ).

Methods: The cross-sectional was conducted at 7 public schools located in Central of Thailand in December 2018. The behavioral problems were assessed by using the Strengths and Difficulties Questionnaire (SDQ) which is one of the most frequently used instruments to screen behavior problem in children and with the self-report SDQ and teacher-SDQ can increase the validity of the test. The social media addiction were assessed by using The Bergen social media addiction scale which is a 6 items questionnaire to screen social media addiction due to reliability and validity it can be used as a standardized screening tool to our study. Multiple logistic regression analysis was used to identify the risk factors associated with the behavioral problems.

Results: The total of 1,118 were enrolled into the study. The prevalence of the social media misused and behavioral problems were 85% and 18.5%, respectively. The prevalence of the subscale behavioral problems were peer problem (21%), emotional problem (19%), hyperactivities (10%) and conduct problem (4%). The independent factors associated with behavioral problems were include sleep problem (OR = 3.3; 95%CI, 2.1-5.1), prosocial behavior (OR = 0.4; 95%CI, 0.3-0.6), social media misused (OR = 2.5; 95%CI, 1.7-3.8), Facebook addiction (OR = 1.8; 95%CI, 1.1-3.0) and Line addiction (OR = 2.8; 95%CI, 1.5-5.1).

Conclusion: This study highlight the association between the social media misused and high prevalence of behavioral problems among adolescent in Thailand. The information of the potential risk factors should be inform to all stakeholders for develop and implement the effective intervention for young adults in Thailand.

Keywords: behavior problems, adolescent, prevalence, associated factors, The Strength and Difficulties Questionnaire

Road Traffic Accident among Student in Secondary School of Chachoengsao, Thailand: Mixed-method Study

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Background: Thailand was ranked 2nd car accident death. However, there are very few road traffic accident (RTA) data from primary survey and there were few qualitative study focusing in young adult.

Objectives: This study aimed to assess primary data, both quantitative and qualitative in Chachoengsao young adult group.

Methods: We conducted a sequential explanatory mixed method in Chachoengsao, Thailand. Quantitative study we using a two-stage stratified cluster sampling design. We used online questionnaire to collect demographic data, risk factor and any accident that happen in past 1 years. Then we estimated the prevalence of RTA and associated risk factors. For qualitative study, purposive sampling design was used to recruit participants and performed the in-dept interview for further information of the causes of RTA. Their views concerning accident, helmet use and adaptation and prevention were questioned using semi-structured interviews. The interview was performed to reach information saturation. Data were analyzed using content analysis method.

Results: The total sample was 11,889 students of whom, 1,111 (9.3%) students answered the online questionnaire on RTA. The overall prevalence of self-reported road accident in last 12 month was 21%. A motorcycle driving was reported the highest rate of accident (77.7%). We found strong associations between school size, helmet use, hand held mobile phone, grades and RTA. Student who wearing helmet were more likely to reported accident compare to who did not (OR 1.56; 95%CI, 1.15-2.11). Three themes were identified: accident, helmet use and adaptation and prevention and 3 sub-themes were extracted.

Conclusion: According to the student, they concerned the RTA situation and already known the risky behaviors. Therefore, intervention to build more attention to reduce RTA should be done.

Keywords: road traffic accident, students, mixed method study

Incidence and Associated Factors of Asthmatic Exacerbation in Asthma Patients in Sanam Chai Khet Hospital, Chachoengsao Province, Thailand: a Retrospective Cohort Study during 2010-2019

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Background: Asthmatic exacerbation (AE) leads to the damage of bronchial epithelial lining which affects patient's quality of life in either children or adults. Asthma is one of the major diseases in non-communicable disease group. Even if there are many Asthma guidelines, the AE incidence still has been increasing overtime.

Objectives: To determine the incidence and associated factors of asthmatic exacerbation in asthma patients in Sanam Chai Khet Hospital, Chachoengsao Province, Thailand, during 2010-2019.

Methods: This study thoroughly accessed database of patients who has been visiting the 'Asthma clinic' at Sanam Chai Khet Hospital. All patients were first diagnosed during 2010 to 2019. 320 subjects were collected from clinic files which include all demographics and associated data. The data was then recorded into a database for an extensive evaluation of incidence and associated factors to asthmatic exacerbation in asthma patients.

Results: From 320 asthma participants, there were 533 visits at asthma clinic. A total of 357 asthmatic exacerbation visits indicated 16.43/100 person-years (95%CI: 0.48-0.67). From univariate Poisson regression analysis, there are 6 significantly associated factors of asthmatic attacks including age ≥ 40 years old (crude RR = 1.31; 95%CI, 1.06-1.63, p = 0.010), housekeeper (crude RR = 1.46; 95%CI, 1.04-2.04, p = 0.027), smoke exposure (crude RR = 1.30; 95%CI, 1.02-1.66, p = 0.028), family history of asthma (crude RR = 1.27; 95%CI, 1.01-1.58, p = 0.032), underweight (crude RR = 1.89; 95%CI, 1.09-3.29, p = 0.024) and smoking (crude RR = 1.41; 95%CI,1.00-1.99, p = 0.049). From multivariate Poisson regression analysis, age over 40 years old (adjusted RR = 1.30; 95%CI, 1.04-1.62, p = 0.022), family history of asthma (adjusted RR = 1.30; 95%CI, 1.05-1.62, p = 0.019) and underweight (adjusted RR = 2.28; 95%CI, 1.51-3.41, p<0.001) were significantly associated with asthma exacerbation, respectively.

Conclusion: The incidence density of asthma exacerbation is still high and significantly associated factors of AE are age over 40 years old, underweight and family history of asthma. As research own opinion, underweight is an adjustable factor and we suggest that there should be more study of further primary, secondary, and tertiary prevention.

Keywords: asthmatic exacerbation, incidence, associated factors

Prognostic Factors Affecting the Mortality Rate in Patients with Tuberculosis at Sanam Chai Khet Hospital: a Retrospective Cohort Study

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Background: Tuberculosis (TB) is one of the most common contagious diseases which easily spreads from person to person leading to individual health problems, disability, death and causing socioeconomic burden to families throughout the country. Despite the medical advancement, the mortality rate of patients with TB is still increasing each year, especially in Thailand.

Objectives: To analyze the prognostic factors affecting the mortality rate in patients with tuberculosis at Sanam Chai Khet Hospital in Chachoengsao, Thailand.

Methods: A retrospective cohort study was conducted in Sanam Chai Khet Hospital, Chachoengsao. Medical records were retrieved from the Hospital information system and TB cards from October 2014 to August 2020. Data analysis for prognostic factors was carried out using Statistical Package for the Social Sciences (SPSS) version 22.

Results: Out of the 364 tuberculosis patients that were reviewed, 35 cases died, resulting in a mortality rate of 9.61%. The prognostic factors were HIV-associated TB infection (RR=3.95; 95%CI, 1.99-7.84), age more than 60 years old (RR=3.46; 95%CI, 1.83-6.55), relapsed TB infection (RR=3.39; 95%CI, 1.82-6.35) and hypertension (RR=2.06; 95%CI, 1.03-4.10), respectively.

Conclusion: The TB patients particularly with underlying HIV, relapsed TB infection, hypertension and elderly who were identified as risk factors for tuberculosis mortality will get the benefit from this study. To reduce the severity and mortality rate, those TB patients should be reminded by the doctor to have more compliance in the treatment.

Keywords: tuberculosis, prognostic factor, mortality rate

Long-term Cerebrovascular Accident Outcome among Diabetic Patient in Thailand: a Nationwide, Cohort Study

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Background: Cerebrovascular Accidents (CVA) or Stroke is a major health problem in Thailand. It has become one of the leading aetiologies of disability and death of both male and female alike. Diabetes is one of the crucial risk factors that contribute to the stroke morbidity in Thailand. In spite of the fact that, incidence of stroke in Thailand is now being studied in a large population-based cohort study, information regarding cerebrovascular incidence among major population at risk like diabetic patients is still lacking.

Objectives: This study sought to identify incidence rate and risk factors associated with stroke occurrence in diabetic patients.

Methods: A prospective cohort study was conducted using data from electronic health records obtained from DAMUS database of diabetic patients treated at public hospitals in Thailand, whom were stroke- free at enrolment in 1998 and regularly came for follow-up for 20 years. We calculated crude incidence rates for stroke and identified factors associated with stroke occurrence using a multivariate Cox Proportional Hazards regression models.

Results: A total of 33,716 eligible patients with 282,380 person-years of follow-up were studied. There were 819 identified new cases of stroke. During 20 years period from 1998-2018, the incidence rate of stroke was 269.85 events per 100,000 person-years (95%CI, 251.35-289.70). Male diabetic patients tend to have higher incidence rate than female as 378.83 events per 100,000 person-years (95%CI, 340.20– 421.86) and 220.80 events per 100,000 person-years (95%CI, 200.89-242.69), respectively. Being male, positive history of smoking, having hypertension, and having dyslipidaemia were identified as being risk factors associated with stoke occurrence with the adjusted Hazards ratios of 1.56 (95%CI, 1.32-1.85), 1.36 (95%CI, 1.10-1.67), 1.9 (95%CI, 1.50-20.41), and 1.2 (95%CI, 1.01-1.43) respectively.

Conclusion: Incident of cerebrovascular accident among Thai diabetic patients was high, while those who ever smoke, being male, having hypertension, or dyslipidaemia as comorbidities possessed higher risk of stroke occurrence than those without. Thus, diabetic patients who possesses those risk should be recommended to engage in smoking cessation program, stricter control of blood pressure and lipid in order to reduce the risk of strokes.

Keywords: cerebrovascular accidents, diabetes, incidence, risk factors

Incidence and Risk Factors of Diabetic Kidney Disease among Patients with Type 2 Diabetes (T2D) in Thawung Hospital, Lopburi Province, Thailand

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Background: Diabetes is a chronic disease that is a global problem. Currently, it is found that the prevalence of diabetes tends to increase every year. In 2011, the number of people aged 35 years and above in Thailand is 18,943,581. It was found that 1,581,857 had diabetics, and 277,020 had complications accounted for 17.51%. The complication was divided into eyes 23.09%, kidneys 25.09%, foot 17.13%, heart 10.21%, brain 10.12%, and other organs 21.1%. It can be seen that diabetic patients have the most complications on the kidneys, accounting for 1 in 4 of all diabetic patients. In addition, renal complications had the most expenditure for lifelong healthcare among microvascular complications.

Objectives: To determine the incidence and risk factors of diabetic kidney diseases among patients with T2D at Thawung Hospital, Lopburi Province, Thailand.

Methods: A retrospective cohort study was conducted from electronic health record of T2D patients who visited Thawung Hospital during 2013 to 2020 and selected only patients who have not had renal complication and aged 20 years or over. The event of diabetic kidney diseases was presented as incident density. Multivariate Poisson regression analysis was performed to determine the risk factors of diabetic kidney disease among patients with T2D.

Results: The incidence density diabetic kidney disease among patients with T2D was 2.84 per 100 person-years. The risk factors were age (Adjusted incidence rate ratio; IRR = 1.05; 95%CI, 1.03-1.07, p<0.001) Hypertension (Adjusted IRR = 3.36; 95%CI, 2.11-5.33, p<0.001) Insulin exposure (Adjusted IRR = 2.98; 95%CI, 1.94-4.58, p<0.001) and universal health care rights (Adjusted IRR = 2.07; 95%CI, 1.35-3.16, p<0.001).

Conclusion: The study is a knowledge enhancement of diabetes care in Thailand to increase awareness of renal impairment detection, these findings can be applied in clinical practice by formulating measures for the care of diabetic patients with risk factors. To have more concentration in the detection of renal impairment.

Keywords: type 2 diabetes mellitus, kidney disease, diabetic kidney disease, risk factors of diabetic kidney disease

Prevalence and Associating Factors of Macrovascular Complications in Patients with Type 2 Diabetes Mellitus: a Nation-wide Cross-sectional Survey, 2018

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Background: Over the last several decades, the global incidence and prevalence of Type 2 diabetes mellitus (T2DM) has increased significantly. Macrovascular complications are the first rank among most common causes of death in type 2 diabetes mellitus (T2DM) patient with complication. The information on the prevalence of macrovascular complications in Thailand is lacking especially among patients with type 2 diabetes mellitus.

Methods: The objectives of this study were to determine the prevalence of macrovascular complication among patients with diabetes mellitus and to determine factors associated with macrovascular complication in a nation-wide survey. A cross-sectional study to assess national outcomes among patients with diabetes who visited 831 public hospitals in Thailand was conducted in 2018 to evaluate status of care among patients with diabetes aged at least 18 years who received medical treatment in the target hospital for the last 12 months.

Results: A total of 38,568 patients with diabetes were included in this study. Macrovascular complication was detected among 2,813 patients (7.3%). Multivariate analysis was conducted to determine which factors were most associated with macrovascular complication, and the results showed being male (AORs 1.46; 95% CI 1.32-1.62), being in Central region (AORs 1.32; 95% CI 1.15-1.50), being in Eastern region (AORs 1.31; 95% CI 1.12-1.54), being in Northern region (AORs 1.28; 95% CI 1.13-1.45), being in Southern region (AORs 1.22; 95% CI 1.05-1.41) ,age (AORs 1.03; 95% CI 1.03-1.04), duration of DM (AORs 1.01; 95% CI 1.01-1.02), state enterprise officer (AORs 0.84; 95% CI 0.75-0.94), waist circumference (AORs 1.01; 95% CI 1.01-1.01), alcohol drinking (AORs 0.81; 95% CI 0.69-0.94), smoking (AORs 1.35; 95% CI 1.16-1.56), insulin use (AORs 1.18; 95% CI 1.07-1.31), hypertensive comorbidity (AORs 1.98; 95% CI 1.72-2.30), dyslipidemia comorbidity (AORs 1.19; 95% CI 1.08-1.32), gout comorbidity (AORs 1.23; 95% CI 1.05-1.44), peripheral neuropathy comorbidity (AORs 3.45; 95% CI 2.71-4.40), diabetic retinopathy comorbidity (AORs 1.60; 95% CI 1.36-1.87), diabetic kidney disease (AORs 1.49; 95% CI 1.30-1.71) were the highest associated factors for macrovascular complication in this population.

Conclusion: Our data emphasized that macrovascular complication was a problem among patients with type 2 diabetes. Type 2 diabetic patients should be regularly assessed for macrovascular complication and their risk factors should be better controlled. Moreover, the Ministry of Public Health managers and clinicians should provide further preventative strategies to attenuate macrovascular complication.

Keywords: type 2 diabetes, macrovascular complications, prevalence, risk factors

Prevalence and Associated Factors of Microvascular Complications in Patients with Type 2 Diabetes Mellitus: a Nation-wide Cross-sectional Survey, 2018

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Background: Diabetes mellitus is common disease in Thailand. It leads to microvascular complications (diabetic retinopathy, diabetic nephropathy, diabetic neuropathy) which is risk factor for macrovascular complication (coronary artery disease, cerebrovascular disease, peripheral artery disease) and can cause of death. The study on the prevalence and associating factors of microvascular complications among type 2 diabetic patients in Thailand is still lacking. The objectives of this study were to determine the prevalence of microvascular complications in patients with diabetic mellitus type 2 and to determine factors associated with microvascular complications in type 2 diabetic patients.

Objectives: This study was conducted to investigate the prevalence and associating factors of microvascular complications in type 2 diabetic patients to look for the preventional options to decrease both microvascular complications and macrovascular complications and death rate from diabetes mellitus type 2.

Methods: A cross-sectional study to assess outcomes among 38,568 patients with diabetes was conducted in 2018 to evaluate status of care among patients with diabetes aged at least 18 years who received medical treatment in the target hospital for the last 12 months.

Results: A total of 38,568 patients with diabetes were included in this study. Microvascular complications were detected among 4,585 patients (11.9%).Multivariate analysis was conducted to determine which factors were most associated with microvascular complications, and the results showed age (AORs = 1.02; 95%CI, 1.017-1.024), waist circumference (AORs = 1.004; 95%CI, 1.001-1.007), hypertensive comorbidity (AORs = 1.769; 95%CI, 1.594-1.964), dyslipidemia comorbidity (AORs = 1.252; 95%CI, 1.155-1.357), gout comorbidity (AORs = 1.438; 95%CI, 1.263-1.637), HbA1C >=8 (AORs = 1.186; 95%CI, 1.069-1.316) and diabetes mellitus duration > 5 years (AORs = 1.636; 95%CI, 1.515-1.767) were the highest associated factors for microvascular complications in this population.

Conclusion: Our data emphasized the microvascular complications among patients with diabetes. Diabetic patients should be regularly assessed for microvascular complications and their risk factors should be better controlled. Moreover, the Ministry of Public Health managers and clinicians should provide further preventative strategies to decrease both microvascular and macrovascular complications.

Keywords: Diabetic patients, Microvascular complication, Diabetes duration, Thailand

Prevalence and Associated Factors of Cerebrovascular Accident (CVA) among Patients with Type 2 Diabetes: a Nationwide, Cross-sectional Study

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Background: Cerebrovascular accident (CVA) is defined as acute onset of focal neurological deficiency from vascular compromise with other underlying cerebrovascular diseases. CVA is also well-known in the term of acute stroke. It is an emergency situation, which requires early recognition, diagnosis, and management to encourage the convalescent outcome. Type 2 diabetes poses about four times more considerable risk for stroke. Otherwise, these health concerns become the major health burden in Thailand and the leading causes of death and long-term disability in both men and women.

Objectives: The objectives of this study were to determine the prevalence of CVA among patients with type 2 diabetes and to determine factors associated with CVA in a nationwide survey.

Methods: A cross-sectional study was conducted in 2018 to assess national outcomes among patients with diabetes who visited 987 hospitals under the Ministry of Public Health in Thailand. Data were gathered from medical records of those hospitals. The records were collected by DAMUS campaign. Permission to utilize data was submitted and accepted by the Institutional Review Board, Royal Thai Army Medical Department.

Results: A total of 38,568 diabetic patients were recruited in this study. The prevalence in 2018 of CVA in type 2 diabetes patients was 3.2% (95%CI, 3.0-3.4). As we conducted a multivariate analysis, the associated factors were being male (AOR 1.51, $p<0.001$), and smoking (AOR 1.30, $p=0.002$). Moreover, atrial fibrillation (AOR 2.67, $p<0.001$), hypertension (AOR 2.16, $p<0.001$), coronary artery disease (AOR 2.06, $p<0.001$), peripheral neuropathy (AOR 1.90, $p<0.001$), renal insufficiency (AOR 1.53, $p<0.001$), diabetic retinopathy (AOR 1.36, $p=0.005$) and gout (AOR 1.26, $p=0.027$) were associated with stroke in type 2 diabetes.

Conclusion: This study emphasized CVA was a problem among patients with diabetes, as it illustrates the associated factors and other diabetic patient comorbidities. Therefore, patients with type 2 diabetes should be regularly assessed for risk of CVA and factors related to CVA. However, time-course relationship between these factors in type 2 diabetes patients and CVA is encouraged for better understanding of its association.

Keywords: cerebrovascular accidents, stroke, type 2 diabetes, prevalence, associated factors

National Trends in the Prevalence of Diabetic Retinopathy among Thai Type 2 Diabetes (T2D) Patients and Associated Factors: from 2014 to 2018

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Background: Diabetic retinopathy (DR) is one of the most common and serious ocular complications in both developed and developing countries. To date, epidemiological data of DR and their associated factors in Southeast Asian countries especially in Thailand are scarce.

Objectives: We aimed to use the information from the Thailand Diabetes Mellitus/Hypertension (DM/HT) study to determine trends in DR prevalence and also risk factors among Thai patients with type 2 diabetes (T2D).

Methods: A series of cross-sectional surveys of clinical outcomes was conducted annually in 2014, 2015 and 2018 among patients with T2D aged >18 years receiving medical care for at least 12 months. A stratified single stage cluster sampling method that was proportional to the size sampling technique was used to select a nationally and provincially representative sample of patients with T2D in Thailand. A standardized case report form was used to obtain the required information from medical records.

Results: A total of 104,472 Thai patients with T2D were included in the study from 2014 to 2018. The dominant proportion of participants, 70,756 (67.7%), were females. The overall prevalence of DR declined from 6.9% in 2014 to 6.3% in 2015 and 5.0% in 2018 (p for trend < 0.001). After adjusting for potential confounders, the factors associated with DR included survey year, greater duration of DM, geographic regions, hospital levels, social security scheme, dyslipidemia, insulin therapy, high HbA1c level and elevated pulse pressure.

Conclusion: We reported a decreasing in trend in the prevalence of DR among Thai patients with T2D over one half decade. Patients with T2D should be encouraged to control their underlying diseases and engage in other effective interventions. If these modifiable risk factors can be inhibited, DR and other cardiovascular complications will be alleviated.

Keywords: Diabetic retinopathy, Thailand, Trends, HbA1c, Pulse pressure

Factor Influencing Treatment Adherence among HIV Sero-status Positive in ART Clinic, Phaya Mengrai Hospital

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Background: Adherence to ART could promote patient's quality of life, decrease risk of opportunity infection, reduce in morbidity and mortality, sustained economic benefit

Objectives: This study aimed to identify factor associated with treatment adherence among HIV sero-status positive patient in ART clinic, Phaya Mengrai Hospital.

Methods: A case-control study was conducted during September to October 2018 at Phaya Mengrai Hospital. Cases were subjects who has poor treatment adherence, while controls were subject who has good treatment adherence. The studied factors were classified into 3 groups which are patient's factor, medication factor, and health care facility and social support factor. The participant were asked to complete the questionnaire including socio-demographic data, baseline clinical characteristic, and question regarding self-care, attitude toward HIV, medication side effect, family relationship, and quality of healthcare facility service. The data were analyzed using SPSS v. 22. Variable were compared using chi square test, t-test, fisher's exact test, Mann Whitney U test as appropriate. Then binary logistic regression was utilized to find association with p-value < 0.05.

Results: A total 17 cases and 45 controls were included in the study. Among the entire patient related factor, only 'participant's status disclosure to community', 'drug usage' are statistically significant (P < 0.05). Participant who disclose their sero-status to the community have negative association with poor treatment adherence (Odd ratio 0.23, 95% CI 0.07-0.77). Medication related factors, the attitude toward ART adherence is statistically significant. Participant seek for ART for an attitude 'to stay alive' have negative association with poor treatment adherence (unadjusted odd ratio 0.3, 95% CI 1.08-13.37), while participants who seek for ART for an attitude 'to stay alive' tends to have good treatment adherence 3.33 times more. Participant who seek for ART with an attitude 'because doctor said you had to' was found to associate with poor treatment adherence 4.83 times (unadjusted odd ratio 4.83, 95% CI 1.43-16.67).

Conclusion: In patient related factor, sero-status disclosure to the community is associate with good treatment adherence. Illegal drug used associate with poor treatment adherence. Medication-related factor, attitude is the most important factor to determine good or poor treatment adherence despite medication adverse effect.

Keywords: ART adherence, HIV sero-status positive patient

Clinical Factors which associated with Sensorineural Hearing Loss in *Streptococcus suis* Infection Patients in Uttaradit Hospital

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Background: In Thailand, *Streptococcus suis* infection incline to increase constantly. Particularly in Uttaradit province which has been ranked as the second place. One of the most complications is hearing loss, but not occur in all patients. This study discovered the risk factors which tend to increase the chance of hearing loss.

Objectives: To determine associated clinical factors of sensorineural hearing loss in patients with *Streptococcus suis* infection in Uttaradit Hospital

Methods: This study was retrospective case-control study. Data was taken from medical records in ICD-10 system (code G002 and A491) and audiogram of the patients who visited Uttaradit hospital between 2009 to 2019 and were first diagnosed as *Streptococcus suis* infection and had the evidence of auditory examination. 92 patients were chosen which divided into 38 patients who individual has sensorineural hearing loss or mixed hearing loss as a study group and another 54 patients who individual has no hearing loss or conductive hearing loss as a control group by using the descriptive and analytic statistics.

Results: From the study, the results revealed that dyslipidemia and meningitis were associated with significantly increasing the chance of hearing loss 11.76 (95%CI=1.06-130.85, p=0.045) and 5.99 (95%CI=1.55-23.14, p=0.009) times, respectively.

Conclusion: This study shown the patients with *Streptococcus suis* infection with dyslipidemia and/or meningitis have increased the risk of hearing loss. Therefore, the surveillance of these patients is strongly recommended in order to decrease the incidence of hearing loss.

Keywords: *Streptococcus suis*, hearing loss, risk factors

Prevalence and Associated Factors of Diabetic Retinopathy among Type 2 Diabetes Mellitus Patients in 2015 and 2018, Thailand: a Cross-sectional Study

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Background: Diabetic retinopathy (DR) is a leading cause of blindness and visual impairment worldwide and significantly affects the quality of life.

Objectives: This study aimed to investigate the prevalence and risk factors of DR in Thailand in 2015 and 2018, for further practical intervention to reduce the incidence and burden of DR in the future.

Methods: This cross-sectional study was performed on 51,227 T2DM patients who received fundoscopic examination in the past 12 months, nation-wide, Thailand in 2015 and 2018. All data were collected using standardize case report form and were analyzed by logistic regression to determine the risk factors of DR.

Results: The study shows that there was a decreasing prevalence of DR in Thailand, from 7.7% in 2015 and 5.8% in 2018. The factors that most associated with DR are subjects living in the North and South, having HbA1C higher than 8, insulin dependent, positive urine microalbuminuria dipstick test, having peripheral arterial disease, having history of any acute diabetic complication including hyperglycemic crisis, diabetic ketoacidosis, hyperglycemic hyperosmolar state and hypoglycemia, having more than 10 years of diabetic duration and having higher serum creatinine. On the other hand, the study shows that having controlled blood pressure (SBP lower than 130 and DBP lower than 85 mmHg) was founded to be the protective factor of DR in the population.

Conclusion: In Thailand, the prevalence of DR is decrease which reflects the Ministry of Public Health's effective strategies. However, to prevent DR, optimal screening and interventions on reducing risk factors of DR should be implemented.

Keywords: diabetic retinopathy, prevalence, risk factors

Development of a Screening Model for Fatty Liver in Annual Check-up Individuals

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Background: Fatty liver has a possibility to develop into hepatitis, cirrhosis, and liver malignancies. In clinical practice, abdominal ultrasonography, a standard reference procedure, is frequently employed to diagnose the condition. Nevertheless, this method depends on appointment system that put those who need it on long waiting lists. A simple screening tool is needed to detect fatty liver before further abdominal ultrasound investigation.

Objectives: To develop a clinical prediction rule from clinical profiles for screening fatty liver in an individual who attends check-up clinic at Phrae Hospital.

Methods: Prediction research with retrospective case-control analogue for data collection in individuals who attended check-up clinic between January 1st, 2019 to October 31st, 2020. Of 538 individuals undergone abdominal ultrasound by radiologists, 176 had fatty liver (cases) and 362 were confirmed negative (controls). The relationship of clinical profiles such as waist circumferences, Triglyceride (TG) and Alanine aminotransferase (ALT) with fatty liver were investigated by performing multivariable logistic regression. The discriminative ability of the parsimonious prediction model was represented by Area under Receiving Operator Curves (AuROC). The risk score was developed and was evaluated for goodness-of-fit (GOF) using Hosmer-and-Lemeshow test. Diagnostic odds ratio (DOR) and Likelihood ratio positive (LR+) were reported for each level of risk scores.

Results: Clinical profiles that are strongly related to fatty liver are being male, exceeding waist circumference, having a high level of TG and ALT. The final prediction model that consists of these predictors has an AuROC of 0.764. The total score ranges 0-14 marks, where 0-4 refers to a low risk group, 4.5-8 a moderate risk and 8.5-14 a high risk. Each group has the DOR of 0.19 (95%CI: 0.13-0.29), 1.56 (95%CI: 1.08-2.25), and 11.0 (95%CI: 5.90-20.51) and the likelihood ratio positive equals 0.38 (95%CI: 0.29-0.51), 1.30 (95%CI: 1.05-1.61), and 7.93 (95%CI: 4.53-13.88) respectively.

Conclusion: The risk score derived from our study is quite good to distinguish individuals with fatty liver from those without, especially for exceptionally low and high scores. Abdominal ultrasound investigation is suggestive for individuals with high scores. An added-value prediction research including others potential predictors is required for future research

Keywords: Fatty liver, Clinical prediction rules

Differences between Community Hospital Levels and Tuberculosis Treatment Outcomes

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Background: Thailand is listed as one of the countries with high burden of pulmonary tuberculosis (TB). TB is ranked as one of the main cause of death among Thai population. Community hospitals are the first frontier in TB treatment. There were varying levels of community hospitals in Thailand which classified by beds, facilities and amounts of specialists.

Objectives: This study aimed to evaluate differences of treatment outcome of pulmonary tuberculosis between small-sized (F2) and medium-sized (F1) hospitals.

Methods: All patients who received treatments in 4 community hospitals in central Thailand were included. The data collected included baseline characteristics, comorbid illnesses, DOTS, sputum acid fast bacilli (AFB) smear results, chest radiology and treatment outcomes. The data were classified according to hospital levels. Chi-square was used for comparing characteristics of two hospital levels.

Results: There were a total of 786 patients that were eligible for the study. The outcomes of treatment revealed that 81.30% of patients had successful pulmonary TB treatment and 18.70% of patients had unsuccessful pulmonary TB treatment. Most patients (57.3%) received treatment in F2 hospitals. There were differences between existence of comorbid illnesses ($p<0.001$), DOTS ($p<0.001$), sputum AFB smear type ($p<0.001$), sputum AFB at second month ($p=0.046$), and first follow up of chest radiography ($p<0.001$) between patients of two hospital levels. There were statistically difference between successful and unsuccessful treatment outcomes ($p<0.001$) between F1 and F2 level hospitals.

Conclusion: There were various differences in characteristics and treatment outcomes between F1 and F2 hospitals. The reasons behind the result could derived from the fact that F2 hospitals were smaller, lesser-equipped and had fewer staffs and specialists than F1 hospitals. In addition, most of F2 hospitals were run by intern physicians which had unmatched experiences with specialists in larger hospitals. Further studies needed to be done to assess factors that affect unsuccessful TB treatment outcomes in community hospitals of Thailand.

Keywords: pulmonary tuberculosis, treatment outcomes, small-sized hospital, medium sized hospital

A Comparison of Segmentation Techniques for a Vascular Geometry Reconstruction

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Background: Computational modeling is a potential engineering tool which is recently introduced in a clinical prediction such as cardiovascular system and orthopedics. Using medical images from computed tomography (CT) and magnetic resonance (MR) for anatomical geometry reconstruction is mandatory for a patient-specific model. The quality of three dimensional (3D) anatomical geometry model depends on software user's skill and reconstruction methods. The poor 3D anatomical geometry model quality can lead to the improper computational analysis results.

Objectives: This study investigated the quality of geometry reconstruction of abdominal aortic aneurysm (AAA) model by using two different segmentation techniques.

Methods: CT images of AAA were imported into Mimics software. We applied two different segmentation methods for 3D reconstruction: 1) profile line (PL) ranged between 105 and 750 Housefield unit (HU) including bones, organs and soft tissues and 2) dynamic growing region (DRG) allowed selecting various initial mouse-point values +/- 50 HU which fulfilled the model by mouse-clicking on AAA space. A 3D AAA model was finally isolated and reconstructed in the software. The geometry reconstruction results from these 2 segmentation methods were compared visually and quantitatively with CT images.

Results: The AAA anatomical geometry reconstructed from DRG technique was visually better than that from PL technique. Differences in maximum length of major axis using DRG technique are less than that using PL technique when compared to CT image (DRG: -17.32% to 0.31% vs PL: 2.07% to 24.98%). The difference of vascular cross sectional area between DRG technique and CT image is also less than that between PL technique and CT image ($-13.07\pm11.21\%$ vs. $16.21\pm13.11\%$).

Conclusion: Both techniques showed pros and cons for the geometry reconstruction. The segmentation using profile line provided extra territories while the segmentation using dynamic growing region showed missing surfaces when performing 3D anatomical geometry reconstruction.

Keywords: vascular geometry reconstruction, segmentation technique, abdominal aortic aneurysm

Characteristics associated with the Risk of Receiving Non-conservative Treatment of Patients with Maxillofacial Fractures

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Background: In this decade, the numbers of traumatic patients have been rising rapidly and maxillofacial injuries were found increasingly in this group in the same way. Several studies have revealed incidence and epidemiology of maxillofacial injuries in Thai populations which have never been reported about associations between factors and treatments.

Objectives: This study aimed to determine the epidemiology, management of maxillofacial fracture and analyzed the association between treatment and patient related factors.

Methods: We conducted a retrospective study and analyzed all maxillofacial trauma cases admitted at Phrae Hospital and pursuing treatment from January 2018 to August 2020.The diagnoses and treatments were provided by plastic surgeon and maxillofacial surgeon. Descriptive statistics were used for epidemiology and logistic regression for treatment related factors association with outcome.

Results: A total 208 patients were treated. Male (n = 152, 73.1%) and age group below 30 years old (n = 99, 47.6%) were the most frequently affected. The most common etiology was traffic accidents (n = 155, 75.2%). Midface (n = 148, 71.2%) was the majority fracture in the patients. In total, 113 fractures were treated with non-conservative treatment. Mandible fractures were associated with higher probability of requiring surgery (RR 2.38; 95%CI, 1.64-3.46). Patients who are below 30 years old and 30-45 years old were more likely to require surgery (RR 1.79; 95%CI, 1.12-2.98 and RR 1.94; 95%CI, 1.12-3.40). Multiple fractures were trending to operative procedure compared to isolated fracture (RR 1.10; 95%CI, 0.72-1.62).

Conclusion: The factors affecting maxillofacial injuries in Phrae Hospital were male, young patients and often in patients with traffic accidents. As among all types of maxillofacial fracture, mandible fracture had the greatest proportion for operative management.

Keywords: maxillofacial trauma, Phrae Hospital, epidemiology

Ocular Manifestations and Generalization after Ocular Onset in Ocular Myasthenia Gravis: a 5-Year Study at Rajavithi Hospital

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Background: Ocular myasthenia gravis (OMG) is an autoimmune disease that targets neuromuscular junction which initially affects on ocular muscles causing visual problems, including ptosis and diplopia or both. The mainstay of treatment is symptomatic relief with glucocorticoid, depending on physician judgement. Despite the increasing retrospective evidence that glucocorticoid can prevent the progression of the disease to generalized form, it still lacks recommendations from the guideline.

Objectives: To investigate the characteristics of presenting symptoms and outcomes of treatment in MG patients at Rajavithi Hospital.

Methods: A retrospective analysis of patients diagnosed with OMG during 2015-2020 from Neuro-Ophthalmology clinic, Rajavithi Hospital was performed. A total of 126 patients were included in the study. The baseline presenting symptoms were collected from electronic medical records and analyzed according to early and late onset groups. There were 100 patients who had a follow-up time of more than six months. The outcome was the disease progression to generalized MG in a time-to-event analysis. We compared outcomes in patients who received immuno- suppressive treatment with those who did not, using a Cox proportional-hazards model.

Results: Of 126 consecutive patients, 86 (68.3%) were female. The mean age was 48.98 (±19.95). There were 64 (50.8) and 62 patients (49.2%) in the late and early-onset groups. Ptosis was the most frequent presenting symptom in both groups,120 (95.2%), of which 63 patients (50%) were unilateral ptosis and 6 patients did not have clinical ptosis at initial diagnosis. There were 47 patients (37.3%) had only diplopia as a presenting symptom and only 41 patients (32.5%) had combined ptosis and diplopia. There was no statistical significance between presenting symptoms and onset group. Overall, 25 patients (25%) had an end-point event which progressed to generalized form. There was a significantly lower risk of 80% to disease progression (hazard ratio = 0.20, 95%CI, 0.08 to 0.50) in immunosuppressive compared to non-immunosuppressive treatment.

Conclusion: This study reported that immunosuppressive treatment in OMG was associated with the lowered risk of progression of the disease to the generalized form. A randomized and controlled trial of glucocorticoid and other immuno- suppressants in patients with OMG are needed.

Keywords: ocular myasthenia gravis, generalized myasthenia gravis, outcome, AChR antibody, ptosis

Hematopoietic Stem Cell Transplantation after Chimeric Antigen Receptor T-cell Therapy in Relapsed/Refractory Acute Lymphoblastic Leukemia Patients: a Systematic Review and Meta-analysis

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Background: Currently, there is no consensus on the necessity of hematopoietic stem cell transplantation (HSCT) after chimeric antigen receptor (CAR) T-cell therapy.

Objectives: This systematic review aimed to explore the survival benefit of HSCT after CAR T-cell therapy in relapsed/refractory (R/R) acute lymphoblastic leukemia (ALL) patients.

Methods: We searched Pubmed, Scopus, Web of Science, Cochrane Central Register of Controlled Trials, Academic Search Complete, and CINAHL Complete from the inception of each database to July 10, 2020. We also conducted hand and ClinicalTrial.gov searches. The inclusion criteria for a study were: i) 10 or more R/R ALL patients; ii) at least two groups of HSCT recipients and HSCT nonrecipients; and iii) reporting the multivariate cox proportional hazard ratio of overall survival (OS), event-free survival (EFS), or disease-free survival (DFS). We performed meta-analyses of logarithmic hazard ratio (logHR) to compare the survival outcomes between the HSCT recipient and the HSCT nonrecipient groups. The effect sizes were presented alongside with their 95% confidence intervals (CIs).

Results: We included seven studies with 462 participants. HSCT was associated with prolonged OS (logHR = -1.51, 95%CI, -1.98 to -1.03), DFS (logHR = -2.06, 95%CI, -2.86 to -1.25), and EFS (logHR = -1.49, 95%CI = -2.02 to -0.95). However, the certainty of evidence regarding the HSCT after CAR T-cell in R/R ALL patients was very low.

Conclusion: HSCT after CAR T-cell therapy is a promising treatment for R/R ALL patients, but more evidence is required to confirm its efficacy and safety

Keywords: Hematopoietic stem cell transplantation, CAR T-cell therapy, Relapsed/refractory acute lymphoblastic leukemia, Systematic review, Meta-analysis

Biomarkers of Dry Eye Disease: a Systematic Review

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Background: Dry eye disease (DED), a multifactorial disorder affecting the ocular surface, remarkably impacts life quality. The limitation in DED management is its complex aetiology and a lack of correlation between clinical signs and symptoms, which invites the emergence of biomarkers as a new diagnostic device and therapeutic target for DED.

Objectives: This research aimed to classify DED biomarkers, analyse the trend of novel DED biomarker investigation and identify specific biomarker for DED subtypes including Sjörden's Syndrome (SS), Meibomian gland dysfunction (MGD), and ocular Graft vs Host Disease (oGVHD).

Methods: Literature search for all DED biomarkers indexed in PubMed between January 2015 - October 2019. Data for each biomarker's role(s) in the DED pathogenic pathway was collected, and the number of novel biomarkers investigated each year were quantified. Statistical analysis was performed using the Microsoft Excel (2017) on the number of inflammatory, anti-inflammatory, immune modulator biomarkers.

Results: One hundred and thirty nine biomarkers were classified as therapy-related (2.88%), lifestyle-related (2.88%), functional (15.83%), and molecular (78.42%). The greatest functional role of molecular biomarkers was inflammation (30.15%), anti-inflammation (8.82%), immune modulation (8.09%). Statistical analysis shows that inflammatory biomarkers ($p = 0.0409$) have been the most investigated biomarker in the past four years, with a trend that continues to increase annually. DED subtype-specific biomarker with greatest fold change in MGD were CU, ANXA1, IL-6; in oGvHD were IL-6, IL-10, IFN-γ; in SS were FURIN, IL-17A, E-FABP.

Conclusion: The role of most DED biomarkers represents an increase in inflammation, a decrease in anti-inflammation, and an imbalance of immune modulation that eventually leads to DED. As new and highly effective therapies for DED can be developed from anti-inflammatory and immune modulator biomarkers, they are worth further exploration alongside with the inflammatory biomarkers. Also, specific biomarkers to each DED subtype can be used for disease stratification and guide treatment choice.

Keywords: Dry eye disease, Biomarkers, Inflammation, Quality of life

A Review of Factors Influencing Take-rates of Patient-derived Xenografts

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Background: Cancer is a major cause of global disability and mortality. Preclinical cancer drug development is restricted due to the scarcity of preclinical models that may efficiently recapitulate the heterogeneity of cancer. Patient-derived xenografts (PDXs) are attractive preclinical models as they offer relatively better predictive value to traditional cell line models. However, their main challenges are the inconsistencies in their take-rates. A systematic and comparative approach to this topic has not far been reported.

Objectives: This systematic review aimed to identify and investigate factors influencing take-rates of PDXs. The objectives are to review current methodologies and materials for PDX generation and to give recommendations on highlighted issues.

Methods: This systematic review was performed on all available researches on factors influencing take-rates of PDXs via PRISMA statement method. An electronic search was conducted using EMBASE and PubMed up to November 2019.

Results: The EMBASE search returned 169 papers and the PubMed search returned 74 papers. Additional 15 studies were added to screening process. After duplicate removal, titles and Abstract:s were screened for eligibility. The total of 37 papers were included in this review. This review highlighted that stage/ grade of tumour, tumour size, metastasis, Ki-67 expression, breast cancer subtype, infiltration of lymphocytes, mice type, hormonal supplementation, implantation site, and Matrigel application are major factors influencing take-rates of PDXs.

Conclusion: To improve the take-rates: specimens with better prognosis should be investigated, lymphoproliferative tumours and Epstein-Barr virus levels in tumour specimens should be validated prior to the implantations, cost-efficient alternative imaging techniques for orthotopic implantations should be considered, and Matrigel should be applied in samples with prolonged ex vivo period. Future comparative studies should be conducted to exclude confounding factors.

Keywords: Xenograft, cancer, patient-derived model, Take-rates, patient-derived xenografts

Effect of Plasma Exchange in Neuromyelitis Optica Spectrum Disorders (NMOSD): a Systematic Review and Meta-analysis

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Background: Plasma exchange (TPE) is a commonly utilized rescue therapy for severe neuromyelitis optica spectrum disorders (NMOSD) attacks, although data on its efficacy remain relatively unclear.

Objectives: To conduct systematic review and meta-analysis for the efficacy of therapeutic plasma exchange (TPE) for neuromyelitis optica spectrum disorder (NMOSD) with an acute attack.

Methods: Systematic review was performed using EMBASE and OVID/Medline database. The eligible studies must be the studies of NMOSD patients treated with TPE during the acute phase. They must report treatment outcomes using either Expanded Disability Status Scale (EDSS) or visual acuity (VA) before and after the therapy. Pooled MD was then calculated by combining MDs of each study using the random-effects model.

Results: Fifteen studies were identified; eleven with 241 NMOSD patients reported EDSS outcome and four studies with 103 NMOSD reported visual outcomes. The meta-analysis demonstrated a significantly decreased in EDSS after TPE treatment for NMOSD with an acute attack with the pooled MD of 0.83 (95%CI, 0.26-1.40; I2 69%) comparing pre-treatment to immediate post-treatment and 2.13 (95%CI, 1.55-2.70; I2 31%) comparing pre-treatment to post-treatment at 6 months to 1-year follow-up. Unfortunately, only one of the four studies evaluating visual outcomes reported SD in association with mean LogMAR; therefore, the meta-analysis cannot be conducted. Nonetheless, all studies consistently demonstrated the benefit of TPE with improved VA and/or LogMAR after treatment.

Conclusion: This systematic review and meta-analysis showed the benefit of TPE during the NMOSD attack with a significantly improved disability status immediately after treatment and during follow-up.

Keywords: neuromyelitis optica, plasma exchange, transverse myelitis, optic neuritis, autoimmune disease

Efficacy and Safety of Mycophenolate Mofetil Therapy in Neuromyelitis Optica Spectrum Disorders: a Systematic Review and Meta-analysis

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Background: Neuromyelitis optica spectrum disorders (NMOSD) is an autoimmune demyelinating disease of the central nervous system characterized by severe attacks of optic nerve and spinal cord. Mycophenolate mofetil (MMF) is an immunosuppressive agent which is widely prescribed for NMOSD patients.

Objectives: This systematic review and meta-analysis aimed to assess the efficacy and safety of MMF in controlling relapse and disease severity.

Methods: Studies were obtained from the EMBASE and Ovid MEDLINE databases. Eligible studies were the studies of NMOSD patients treated with MMF which reported treatment outcomes as Annualized Relapse Rate (ARR) or Expanded Disability Status Scale (EDSS) before and after treatment. Case reports, case series less than 3 patients, and reviews were excluded.

Results: Fifteen studies included 1,047 patients, of whom 915 (87.4%) were aquaporin-4 immunoglobulin seropositive. The total number of patients that received MMF was 799. Meta-analysis on ARR and EDSS were conducted in 4 studies with a total of 200 patients and 3 studies with a total of 158 patients, respectively. The result showed a significant improvement with a mean reduction of 1.13 (95%CI, 0.60-1.65) in ARR and a mean reduction of 0.85 (95% CI, 0.36-1.34) in EDSS after MMF therapy. Adverse effects occurred in 106 (17.8%) of 594 patients that were documented having side-effects during MMF therapy.

Conclusion: This systematic review and meta-analysis showed that using MMF as a preventive therapy in NMOSD patients can significantly reduce relapse rate and improve disease severity with an acceptable tolerability.

Keywords: mycophenolate mofetil, neuromyelitis optica, disability, relapse, systematic review and meta-analysis

The association between Irritable Bowel Syndrome and Osteoporosis: a Systematic Review and Meta-analysis

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Background: Gastrointestinal disorders such as inflammatory bowel disease and celiac disease are generally regarded as risk factors for osteoporosis. Recent studies have found that irritable bowel syndrome which (IBS), another common chronic functional gastrointestinal disorder affecting approximately over 10% of the global population, can predispose patients to osteoporosis; however, the evidence is still limited.

Objectives: The current study aimed to comprehensively examine the risk of osteoporosis among patients with IBS using systematic review and meta-analysis technique.

Methods: Literature search was independently conducted by two investigators using MEDLINE, EMBASE and Google Scholar database up to October 2019. Eligible study could be either cross-sectional study, case-control study or cohort study. It must report whether patients with IBS have a higher risk of osteoporosis and/or osteoporotic fracture. Point estimates and standard errors from each eligible study were combined together using the generic inverse variance method of DerSimonian and Laird.

Results: Of the 320 articles identified from the three databases, four cohort and one cross-sectional studies with 526,633 participants met the eligibility criteria and were included into the meta-analysis. All five studies investigated the risk of osteoporosis among patients with IBS and the pooled analysis found that patients with IBS had a significantly higher risk of osteoporosis than individuals without IBS with the pooled risk ratio of 1.95 (95%CI, 1.04-3.64; I2 100%). Three studies investigated the risk of osteoporotic fracture and the pooled analysis found that patients with IBS also had a higher risk of osteoporotic fracture than individuals without IBS with the pooled risk ratio of 1.58 although statistical significance was not reached (95%CI, 0.95 to 2.62; I2 99%).

Conclusion: A significantly increased risk of osteoporosis among IBS patients was observed in this study. Early intervention to prevent the development of osteoporosis, such weight-bearing exercise, adequate intake of vitamin D and calcium as well as early screening for osteoporosis, may be beneficial for these patients.

Keywords: Irritable Bowel Syndrome, Osteoporosis, Fractures, Epidemiology, Meta-analysis

ABSTRACT: POSTER PRESENTATION

Basic Science Research

Medical Education Research

Community-based Research

Hospital-based Research

Kanamycin Resistance in *Pseudomonas aeruginosa*

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Background: *Pseudomonas aeruginosa* is the main leading cause of nosocomial infections, morbidity and mortality in patients with HIV/AIDs, cystic fibrosis and immunocompromised patients. It harbours a chromosomal aph gene which encodes for aminoglycoside phosphotransferase, most crucial enzyme conferring the inactivation of aminoglycoside antibiotics and the resistance against kanamycin and neomycin. Its resistance to such antibiotics makes it difficult to be eradicated from medical equipment and clinical wards.

Objectives: This study aimed to remove the aph gene from six *P. aeruginosa* clinical isolates (PA-W02, 12, 21, 24, 25, and 29) and to identify whether the aph gene is the major factor causing kanamycin resistance in *P. aeruginosa.*

Methods: Initially, the suicide plasmid pME3087 with aph gene deletion was extracted from *E. coli* DH5-alpha and transformed into the conjugative strain S17-1. Then the plasmid was transferred to *P. aeruginosa* clinical isolates via conjugation; a two-step homologous recombination of *P. aeruginosa* and enrichment of Tetracycline-sensitive cells were conducted. Following the screening for Tetracycline-sensitive clones, potential mutants with aph gene deletion were tested against neomycin. Finally, the PCR was performed to confirm the deletion of the aph gene in these *P. aeruginosa* clinical isolates.

Results: Among three clinical isolate mutants tested for neomycin susceptibility, only potential mutants of PA-W29 became more susceptible to neomycin. An increase in neomycin resistance was observed in potential mutants of PA-W24.

Conclusion: It is convincing that the aph gene deletion in PA-W29 is successful as it became more sensitive to neomycin. However, this is inconclusive because the aph deletion cannot be confirmed due to failure of PCRs, and therefore further investigations need to be carried out. If the aph gene has shown to be the main factor causing aminoglycosides resistance, then it should be possible to reduce the aminoglycosides resistance in *P. aeruginosa* so that kanamycin and neomycin become therapeutically effective.

Keywords: *Pseudomonas aeruginosa*, aminoglycoside resistance, kanamycin

Understanding Phenotypic Diversity of *Pseudomonas aeruginosa* in Chronic Wounds

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Background: Chronic wounds harbour a polymicrobial ecology that prolongs tissue repairing processes. *Pseudomonas aeruginosa* is a common opportunistic pathogen that resides in chronic wounds and plays a major role in the pathogenesis of infections in cystic fibrosis and diabetic ulcers by being phenotypically diverse. The phenotypic diversity of *P. aeruginosa* often complicates microbiology analysis on patient samples, especially in antibiotic susceptibility tests.

Objectives: To evaluate how much phenotypic diversity is presented in a population of *P. aeruginosa* from a chronic wound of a diabetic patient.

Methods: Clinical samples from in vivo chronic diabetic ulcers were used to isolate a population of *P. aeruginosa*. Forty isolates were selected from the population and were screened for virulence-associated phenotypes by analysing 6 phenotypic characteristics in in vitro assays: colony morphology, antibiotic susceptibility, quorum sensing molecules detection, total protease production, pyocyanin quantification, and siderophore production. Extraction of the isolates' supernatant was done to test for the latter 4 assays.

Results: A small degree of phenotypic diversity within a *P. aeruginosa* population from a sample of a chronic diabetic wound was detected in the study. Few isolates showed variation from the main phenotype observed in each assay. A low production of virulence factors was observed in the majority of the isolates.

Conclusion: The results allowed an advancement of the understanding of phenotypic diversity of *P. aeruginosa* within populations found in diabetic chronic infections. In support with other studies, the characteristics of *P. aeruginosa* within a population in chronic infections will be underestimated if one or few colonies are analysed per sample as it underestimates the phenotypic diversity aspect of the bacteria.

Keywords: chronic wound, *Pseudomonas aeruginosa*, phenotype

Differential Effects of Heavy Metals on CCL2 Secretion from Human Astrocyte

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Background: Neurodegenerative diseases such as Alzheimer's disease, Parkinson's disease and multiple sclerosis, are related to neuroinflammation. Astrocyte play a role in CNS infection and inflammation. Heavy metal contamination is commonly found in developing countries from industry and agriculture. Chemokine (C-C motif) ligand 2 (CCL2) plays a role in CNS pathology, ischemic stroke, traumatic brain injury, and multiple sclerosis. Cadmium increased CCL2 levels in urine. Our previous study showed that cadmium induces IL-6 and IL-8 release from human astrocytes. Herein, we hypothesize that cadmium and other heavy metals could stimulate CCL2 secretion from astrocytes.

Objectives: To compare the effect of four heavy metals including cadmium, copper, manganese and nickel on CCL2 secretion from human astrocyte.

Methods: U-87 MG cells were exposed to heavy metals at 1, 10 and 100 µM for 24 hours. Cell viability and CCL2 levels in supernatant were measured by MTT and ELISAs, respectively.

Results: Cadmium chloride and copper sulfate at 100 µM decreased cell viability to less than 20% and 70%, respectively. Therefore, the maximum test dose for cadmium chloride and copper sulfate was 10 µM. At 1 and 10 µM, only cadmium chloride increased CCL2 levels by 3 to 4 folds, while other heavy metals did not induce CCL2 secretion. Manganese chloride and nickel chloride at 100 µM were not toxic to human astrocytes. At 100 µM, manganese chloride increased CCL2 levels by 68%, while nickel chloride had no effect on CCL2 secretion.

Conclusion: Cadmium has the highest effect on CCL2 release, while manganese also triggers CCL2 release in a concentration-dependent manner. The increased levels of CCL2 could contribute to the association of heavy metal and neurodegenerative diseases and the reduction of CCL2 may reduce CNS toxicity of cadmium and manganese.

Keywords: astrocyte, cadmium, heavy metals, CCL2, CNS pathology

Development of Extraction Methods to Enable Rapid Diagnosis of Infection by Next Generation DNA Sequencing

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Background: Even though the traditional methods (such as culturing) for microbial infections have been used for many years, these approaches present high risks of contamination and are time-consuming. The empirical treatment, which involves the use of broad-spectrum antibiotics, has also been employed. In most cases, such methods influence realisation of false-positive results, which may eventually influence misdiagnosis and antibiotic resistance. Therefore, there is an increasing demand for the development of rapid diagnosis of microbial infections, such as the next generation sequencing (NGS), to solve such problems. This study compared manual and automatic extraction methods on various clinical samples treated and untreated by propidium monoazide (lyPMA).

Objectives: Development of extraction methods to enable rapid diagnosis of infection by next generation DNA sequencing

Methods: In order to achieve the outlined goal, the spiked clinical samples were aliquoted. Here, one group was treated with lyPMA, while another one remained untreated. The DNA in the samples were then extracted by using either the manual approach (with the GenElute) or the automatic approach (where the easyMAG was utilised). The obtained DNA concentrations were then analysed by using the thermo-scientific nanodrop. The real-time polymerase chain reaction (PCR) was used for the quantification of the DNA concentrations by producing the Ct values.

Results: The data from the completed analysis exhibited that the automatic DNA extraction gave purer products than manual extraction on both types of spiked clinical samples, including urine and nasopharyngeal aspirate (NPA). The results further revealed that the lyPMA works better with automatic extraction.

Conclusion: The obtained Ct values proposed a clear suggestion that the lyPMA would influence the successful depletion of human background DNA. Both viral and bacterial strains were also depleted, an observation that was not expected. However, the E. coli produced positive results on the urine samples, since the Ct values remained the same even after being treated with lyPMA.

Keywords: DNA extraction method, next generation DNA sequencing

Creating yrbH Mutants in *Yersinia pseudotuberculosis* to Investigate its Functional Role in Biofilm Formation

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Background: *Yersinia pseudotuberculosis* causes self-limiting gastroenteritis and shares genetic similarities with *Yersinia pestis*, the aetiological agent of plague pandemics that wiped out half of Europe's population. The pathogen is transmitted to humans via fleabites, which resulted from biofilms being formed in the flea's proventriculus, blocking their gut and feeding. Biofilm formation is regulated by multiple genes including yrbH that possesses additional unknown functions other than synthesizing core lipopolysaccharides.

Objectives: The aim of this study was to investigate the functional roles of yrbH in Yersinia biofilm formation by creating yrbH mutants in *Y. pseudotuberculosis* YPIII using the previously generated construct. This would be achieved by replacing targeted genes in *Y. pseudotuberculosis* YPIII with the yrbH containing Kan cassette cloned in pDM4 suicide vectors through the induction of double crossover events in homologous recombination, using conjugation and transformation by electroporation.

Methods: The pDM4 suicide vector with yrbH containing kanamycin resistance cassette constructed from the previous experiment is being transferred from *E. coli* S17-1 to *Y. pseudotuberculosis* YPIII with homologous recombination via conjugation and transformation by electroporation in various conditions. The selection and screening for double crossover events of yrbH:km chromosomal integration were conducted with replica plating and combinations of specific antibiotics and sucrose solutions. Colony and screening PCR with gel electrophoresis were used to confirm the presence of mutants.

Results: A total of 1,445 colonies produced from conjugation and transformation by electroporation were screened with replica plating, which together yield 8 colonies with potential mutants indicated from their resistance to sucrose and appropriate antibiotics. However, PCR procedures with gel electrophoresis revealed bands of similar sizes to *Y. pseudotuberculosis* YPIII (parental strain), implying the absence of double crossover events in homologous recombination and therefore, no mutants were obtained.

Conclusion: Even though *Y. pseudotuberculosis* yrbH mutants were not created from the following approaches, this study is not considered as a complete failure by achieving single crossover mutants for additional double recombination enhancement procedures. Furthermore, this study can be utilized as a significant model to create yrbH mutants in the future for further research in Yersinia biofilm formation.

Keywords: *Yersinia pseudotuberculosis*, yrbH, biofilm, pDM4 suicide vector, homologous recombination

Characterisation of Gonococcal Toxin-antitoxin Systems

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Background: MazEF, one of the toxin-antitoxin (TA) systems existing in Gram-negative, strictly human *Neisseria gonorrhoeae*, has tremendous effects on the bacterial cellular responses. In other bacteria, studies have shown that under exposure to stressful conditions, MazEF TA system plays an important role in the induction of a dormant state, formation of biofilm and generation of antibiotic-resistant strains.

Objectives: This project aimed to created *N. gonorrhoeae* mutants that do not contain a MazEF TA system by using a technique of splicing by overlapping extension (SOE). The mutant would be compared to the gonococcal wild-type to uncover the MazEF TA system's influence and effects on the bacterium under varying conditions.

Methods: To create *N. gonorrhoeae* mutants, upstream, Kan cassette and downstream flanking were amplified from DNA templates by polymerase chain reaction (PCR) using designed primers that contained complementary tail sequences. The SOE technique was utilised to combine those three fragments, which the overlapping 3' ends generated by the custom primers in each fragment would be annealed and expanded under two consecutive PCR conditions. The combined upstream-Kan cassette-downstream DNA would be inserted and replaced the MazEF in *N. gonorrhoeae* by solid transformation.

Results: The upstream-Kanamycin cassette fragment was successfully acquired by SOE reaction of upstream flanking and Kan cassette PCRs. The downstream flanking could not be amplified from the DNA template, although various combinations of primers and annealing temperatures were applied. Therefore, the mutant could not be generated due to the failure to create combined upstream-Kanamycin cassette-downstream DNA. It is suspected that there is a potential mutation, either induced by laboratory procedures or GC's transformable nature, of genome sequence in GC strain FA1090 used.

Conclusion: Mutations of the DNA template were suspected to be the source of the downstream PCR's problem, which could be identified by performing further PCRs. After obtaining the final combined DNA, a solid transformation technique would be used to generate *N. gonorrhoeae* mutants.

Keywords: MazEF toxin-antitoxin (TA) systems, splicing by overlapping extension (SOE), *Neisseria gonorrhoeae*

Plumbagin Decreased Cadmium-induced IL-6 Release from MDA-MB-231 Cells

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Background: Cadmium, a toxic heavy metal, is linked with the development of several types of cancers. Cadmium promotes cell growth, migration, invasion and proliferation in both estrogen-dependent and triple-negative breast cancer (TNBC) cells through several mechanisms. In addition to its toxic properties, cadmium also induces the secretion of various cytokines and chemokines, including interleukin-6 (IL-6) in human glioblastoma U-87 MG, bronchial epithelial (HBE) Calu-3 and monocytic THP-1 cell lines. Elevated serum IL-6 level is associated with tumor progression of various type of cancers including breast cancer. IL-6 increases cell proliferation of MDA-MB-231, a TNBC cell line. Plumbagin, a quinone isolated from the root of *Plumbago zeylanica*, is toxic to cancer cells, including MDA-MB-231 cells. Plumbagin decreased expression of CCL2 in MDA-MB-231 and CXCR4 in estrogen receptor-positive breast cancer cell BT-474.

Objectives: We aimed that cadmium induced IL-6 expression in MDA-MB-231 cells and plumbagin could reduce IL-6 expression.

Methods: In the present study, MDA-MB-231 cells were treated with cadmium, plumbagin or cadmium plus plumbagin for 24 hours. Cell viability was determined by MTT assays and IL-6 levels in supernatant were measured by ELISAs.

Results: Cadmium at 1 and 10 micromolar, plumbagin at 1 micromolar and cadmium plus plumbagin did not reduce cell viability. Cadmium at 1 and 10 micromolar increased the IL-6 levels in supernatant by 2 folds compared to untreated cells, while plumbagin at 1 micromolar decreased cadmium-induced IL-6 levels by 35-48%.

Conclusion: Taken together, our results showed that plumbagin could reduce cadmium-induced IL-6 production in MDA-MB-231 triple-negative breast cancer cells. The ability to reduce IL-6 levels of plumbagin could be beneficial as an alternative or adjunctive anticancer agent for the treatment of triple-negative breast cancers.

Keywords: cadmium, plumbagin, IL-6, triple-negative breast cancer

Developing Comprehensive Preconception Carrier Screening for 21-hydroxylase-deficient Congenital Adrenal Hyperplasia in Thai Population

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Background: 21-hydroxylase-deficient Congenital Adrenal Hyperplasia (21- OHD CAH) is an autosomal recessive disorder causing by the mutations in CYP21A2. This condition has diverse clinical severity, ranging from classical severe neonatal life-threatening-- salt-wasting crises-- to mild non-classical form. Additionally, the classical form is able to induce simple-virilization resulting in ambiguous genitalia in females and precocious puberty in males. Identifying couple-at-risk at the preconception stage will have a benefit on prenatal fetal monitoring and treatment.

Objectives: To establish rapid molecular methods to detect 9 common CYP21A2 mutations.

Methods: We developed a rapid molecular method to detect 9 common CYP21A2 mutations which have been reported as common etiologies for both classical and non-classical forms. Amplification-Refractory Mutation Null variant or large gene deletion testing was performed by real- time PCR (rt-PCR) and PCR-based Restriction Fragment Length Polymorphism (PCR-RFLP). These screening tools were then tested in 50 enrolled subjects at preconception genetics clinic.

Results: The developed techniques revealed the consistent results to the standard methods and controls. Two of 50 subjects (1/25) were identified as 21-OHD CAH carrier. Of them, one was interpreted as a carrier for large-scale gene deletion, whereas another case carried 2 variants locate within the adjacent exons, Q318X and R356W which was likely in cis.

Conclusion: Carrier screening for 21-OHD CAH using the mentioned techniques were reliable and rapid. The cost was also competitive to be proposed as a national screening.

Keywords: 21-hydroxylase-deficient congenital adrenal hyperplasia, CYP21A2, molecular methods

Comparison of Learning Efficiency between Online Flipped Classroom and Online Traditional Classroom of the Second-year Medical Students, Mae Fah Luang University

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Background: By integrating technology such as online learning with appropriate pedagogy, better learning efficiency can be achieved for medical education in the future. Although, many studies had shown that flipped classroom has better result of learning efficiency than traditional classroom has, those studies were conducted face-to-face. Subsequently, this study focuses on comparing learning efficiency of both pedagogy on online learning.

Objectives: To compare learning efficiency between online flipped classroom and online traditional classroom.

Methods: This randomized controlled trial, with crossover design (double- blinded, assessor and investigator) was conducted on 31 volunteers. First, the volunteers were randomly divided into two groups, group A with 15 members and group B with 16 members. These groups started the first study period with different pedagogies; group A attended flipped classroom and group B attended traditional classroom. Then, in the second study period, the two groups were switched over to attend the other pedagogy to eliminate the effects of other individual factors. The pre-test scores and post-test scores, collected before and after the classes, were analysed with paired-t-test, student-t-test and multilevel logistic regression analysis.

Results: Learning efficiency in two pedagogies are not statistically different ($p>0.05$). Mean post-test score in online traditional classroom ($\pm SD$) is 8.71 (± 3.62) which is more than mean post-test score in online classroom with 8.26 (± 2.63).

Conclusion: Many factors could probably alter learning efficiency of online pedagogy resulting in outcomes that differ from the prior studies. First, online flipped classroom is a new pedagogy that requires more adaptation. Second, this study was conducted in a limited period of time and the amount of time managed for two groups could not be properly controlled. Third, this study was conducted on the regular course of volunteers, so the individual factors cannot be regulated. In conclusion, we suggest further studies in other factors related to improving learning efficiency of online flipped classroom.

Keywords: flipped classroom, traditional classroom, efficiency, online learning

COVID-19 Individual Prevention Behaviors of the Undergraduated Students in Mae Fah Luang University

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Background: Coronavirus disease (COVID-19) is an inexperienced global pandemic which is still ongoing and have no specific vaccine. Therefore, individual prevention behaviors are the best ways to reduce exposure to virus and delay transmission. In Thailand, there is no study about the frequency of individual prevention behaviors and in phase 5 of lock down.

Objectives: To study COVID-19 Individual protection behaviors of the students in Mae Fah Luang University

Methods: A cross-sectional study was conducted by surveying individual prevention behaviors (such as hygiene, social distancing, travelling, seeking on COVID-19 information, and QR code scanning) in 165 undergraduate students of Mae Fah Luang University from May to August 2020 via doing online questionnaire.

Results: The median age of participants is 18. For self-hygiene behaviors, the overall median score is 3 (min=1.5, max=4). For washing hands, the median score is 3-4 times per week. For wearing mask, the median score is 3 (min=1, max=4). For social distancing, the overall median score is 2.5 (min=1, max=4). For traveling, 81.21% and 99.39% of participants no travel to countryside and aboard respectively. For seeking on the COVID-19 information, the source participants seek on the most is Facebook (72.55%), and median frequency are 3 days per week (min=0, max=7). For frequency of QR code scanning for location tracking by using the "Thai Chana application", the median score is 3 times per week (min=0, max=4).

Conclusion: Mae Fah Luang University's students followed measures and recommendations on the prevention and control of COVID-19 more than 95% that better than overall of previous study.

Keywords: COVID-19, individual behaviors, COVID-19 Prevention, SARS-CoV-2, Thailand

Relationship of Sleep Efficiency and Academic Performance in Physical Inactivity Medical Students, Faculty of Medicine, Siam University

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Background: Medical students exposed to academic stress lead to physical inactivity. Sleep quality and physical exercise can improve cognition. However, the relationship of sleep efficiency, and academic performance in physical inactivity medical students has been not concluded.

Objectives: The present study proposed to determine the relationship between sleep duration and academic performance in physical inactivity medical students.

Methods: This study was a survey study that performed in the first year medical students, Faculty of Medicine, Siam University, Bangkok, Thailand in academic year 2018 by using a questionnaire. The questionnaires consisted of four parts: basic demographic data, the Pittsburgh Sleep Quality Index, the British Medical Association questionnaires, and the amount of physical activity a week. Pearson correlations were analyzed for measure strength of association.

Results: There was 25 physical inactivity medical students. The sleep duration was significantly correlated with body mass index ($r = -0.441$, $p = 0.030$) and GPA ($r = -0.401$, $p = 0.047$) in the physical inactivity medical students.

Conclusion: Poor sleep duration and physical activity in the first year medical students, Faculty of Medicine, Siam University correlated with academic performance. Improving physical exercise and stress management may enhance the improvement in sleep quality and cognition for medical students.

Keywords: GPA, Medical student, Physical exercise, Sleep quality

The Ergonomic Risks in Human Gross Anatomy Dissection Laboratory among Second Year Undergraduate Medical Students in a Medical School in the Three Southern Border Provinces of Thailand

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Background: The laboratory practice of cadaver dissection requires medical students to use certain muscles repetitively, including unhealthy sitting and standing posture. Using a lot of their body parts to do tasks such as the neck, trunk, legs, upper arm, lower arm, and wrists for long hours can cause musculoskeletal injuries.

Objectives: In this study, we investigated the ergonomic risks in laboratory dissection of cadaver among 36 second-year undergraduate medical students at Princess of Naradhiwas University.

Methods: The Rapid Upper Limb Assessment (RULA) method was used as the data collection tool for the sitting position and the Rapid Entire Body Assessment (REBA) method was used for the standing position. Fisher's exact test was used to test correlated data and descriptive statistics were used to describe the parameters.

Results: The result of the RULA method showed that most of the medical students in the sitting positions had a high ergonomic risk level while performing dissections, 52.8% for the right side and 47.22% for the left body side. While the REBA method revealed that most of the medical students with standing positions had a medium ergonomic risk level, 77.78% for the right body side and 75.00% for the left body side. Moreover, the results showed that the body weight and the dominance of hand were statistically significant correlation with the ergonomic risk levels of the RULA method in the left side body.

Conclusion: Finally, all findings in this study can be used as preliminary data to improve and develop innovations apply to decrease the ergonomic risks in laboratory dissection of cadaver among medical students.

Keywords: ergonomic, practical human gross anatomy, medical student, southern border provinces

The Study of Stress Levels affect on Mae Fah Luang University Students' COVID-19 Preventive Action

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Background: During spreading of COVID 19, Mae Fah Luang University announced the prevention action to stop the spreading of disease. Statistical data show that this outbreak causes the population to have increased stress levels which may affect their behaviors. Therefore, the research team would like to study the stress levels that may be related with their responsiveness to the prevention action of Mae Fah Luang University.

Objectives: To study the stress level effect on behaviour for preventing COVID-19 which announced in Mae Fah Luang University of undergraduate students.

Methods: Firstly, the study was started from specifying the sample that was an undergraduate student Mae Fah Luang University. Second, the tools used for data collection was an ST-5 stress assessment and a questionnaire which created by the researcher. Next, the data were collected by using online questionnaires through GOOGLE FORM. Finally, preparing and analyzing the data, setting the statistic and interpretation was performed.

Results: Among 78 students with stress, the mean age was 20.44 years. The relationship between stress and responsiveness to 10 prevention actions identified the odds ratio at 0.96, 1.04, 2.77, 1.17, 1.38, 2.19, 1.20, 1.44, 1.95 and 0.63 respectively, which the sixth prevention action showed a statistical significance.

Conclusion: When the sample had same conditions which are sex, age, and school, the students with stress tended to fail to conduct 8 from 10 prevention actions.

Keywords: stress, behavior, COVID-19, prevention action, college student

The Perspective of Preclinical Medical Students towards Synchronous and Asynchronous Online Study during the COVID-19 Epidemic at Mae Fah Luang University

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Background: Due to the COVID-19, school of medicine of Mae Fah Luang University has adapted from traditional study to online learning, including Synchronous and Asynchronous. This study interested in comparing the satisfaction of preclinical medical students between both online learning formats. As satisfaction can affect the learning efficiency of students.

Objectives: To compare the satisfaction between synchronous and asynchronous online study of preclinical medical students.

Methods: Sampling by using a two-independent means formula. The researcher contacted 27 preclinical medical students who studied online in both Synchronous and Asynchronous classroom directly then asked the questionnaire via google form and analyzed the data using percentage, mean, standard deviation, paired t-tests, linear regression, McNemar's test, and Manifest content analysis.

Results: The overall satisfaction average score of Asynchronous is 3.52 and Synchronous is 3.22 when compared the difference, $p = 0.17$. The different of satisfaction level has $p = 0.08$. Also, 44.4% participants agreed that turning on camera increased learning efficacy and 90.91% agreed that teaching technique increased learning satisfaction.

Conclusion: The satisfaction of preclinical medical students between Synchronous and Asynchronous online study is not significantly different.

Keywords: synchronous, asynchronous, online study, preclinical medical students, COVID-19

Mental Health Survey for Depression, Anxiety, and Stress in Medical Undergraduate Students: a Cross-sectional Study

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Background: These days, mental health problems are universally increased. Medical students are one of the people who are at higher risk as they have more intense factors compared to the other students such as the curriculum, higher self-expectation, and social standard.

Objectives: This cross-sectional descriptive study aimed to examine mental health of medical students separated in 3 axes - depression, anxiety, stress - and its correlations such as gender and study programs.

Methods: We discovered that, by means of moderate to extremely severe levels in each axis, our students had 29.8% depression, 29.8% anxiety, and 22.9% stress. The students' anxiety appeared to be affected by their study programs: student in the consortium of Thai medical school program were more likely to have anxiety than the others ($p < 0.05$). The causes of depression in the 3rd year medical students were most likely to be studying subjects (49.8%), friends (14.6%), and relationship (12.7%), while their anxiety and stress were respectively the consequences of studying subjects (68.3% and 77.1%) and friends (10.7% and 5.9%) The causes of mental problems were not found to be significantly associated with either the students' study programs or their gender. The students would consult their friends, family, and not consulting anybody when they were attacked by depression (41.5%, 31.7%, and 23.9%), anxiety (45.4%, 30.7%, and 21%), and stress (42.4%, 36.1%, and 19%), respectively. There were no significant correlations between the consultants and gender or the study programs.

Results: The study programs in which the medical students are studying involving with their primary base and expectation seem to influence their mental health. Furthermore, there are aggravating factors such as first step national license examination and the more intense curriculum than the previous years. Accordingly, these results may help devising prevention strategies and early detection for them.

Conclusion: The satisfaction of preclinical medical students between Synchronous and Asynchronous online study is not significantly different.

Keywords: mental health, medical students, depression, anxiety, stress

Social Media Addiction and Academic Performance among Medical Cadets at Phramongkutklao College of Medicine, 2019

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Background: To date social media have had a major influence on students' academic performance. These platforms create many opportunities and threats for medical students in various fields. Information of addiction to social media and its impact on medical students' academic performance is limited in Thailand.

Objectives: The purpose of this study was to investigate the prevalence of social media addiction (SMA) and its relationship with academic performance of medical cadets in Phramongkutklao College of Medicine.

Methods: In this cross-sectional study was conducted in October 2019. The Thai version of Bergen Social Media Addiction Scale was used and the students' overall grade point average (GPAX) obtained in previous educational term was considered as the indicator of academic performance.

Results: The total of 190 medical cadets were enrolled into the study, where males constituted (58.95%). The prevalence of SMA was 44.7%. The independent factors associated with SMA were included female students (OR = 2.20; 95%CI, 1.12-4.29) and GPAX score (OR = 0.31; 95%CI, 0.15-0.65).

Conclusion: The SMA of the medical cadets was at moderate level and the female students had a higher level of addiction compared to the male students. There was an inverse and significant relationship between the SMA and academic performance of medical students. Therefore, it is imperative that the educational planner of medical school take interventional steps to support their students who are dependent on these networks and inform them about the negative consequences of addiction to social networks.

Keywords: social media addiction, medical students, prevalence, academic performance

The Effects of Time Spent in Bed and Sleep Quality on Memory and Academic Performance in Freshman Medical Students

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Background: There is growing evidence that health factors affect medical education achievement. Lack of sleeping could contribute to poor memory and academic performance in medical students.

Objectives: The present study aimed to determine the relationship between time spent in bed and sleep quality on memory and academic performance in the first year medical students.

Methods: Forty nine first year medical students, Faculty of Medicine, Siam University in academic year 2018 were randomized and surveyed the quality of sleep and memory by means of the validated Pittsburgh Sleep Quality Index and British Medical Association questionnaires. The data were analyzed by using Pearson product moment correlation analysis, IBM SPSS statistics.

Results: The results showed that time spent in bed was a trend of negatively correlated. Sleep score affected on the memory score significantly and positively correlated ($r = 0.443$, $P = 0.001$) but not academic performance.

Conclusion: Therefore, the first year medical students, Faculty of Medicine, Siam University who had less time spent in bed and low sleep scores could be good memories.

Keywords: education achievement, time spent in bed, sleep quality, memory, academic performance

Efficiency Evaluation of Elective Courses Selection for First Year Medical Students

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Background: Faculty of Medicine, Prince of Songkla University have started 2-week-elective-courses for first-year medical students since 2018, including Diet for health, Essential Economics, Exercise for Life, Expertise Photo, Machine Learning, Medical Research Incubation, Meditech, Music for Health and Sketch & Paint to enhance their interested skill, quality of life and well-being. Students could select based on their own interest.

Objectives: The objective of this study was to evaluate the satisfaction and efficiency of selected course in the way of student self-improvement and their quality of life after finish the elective course

Methods: To survey the satisfaction and effectiveness of elective courses by using an online questionnaire to collect the responses from first-year medical students. For those who gave low score from online survey, individual interview have been performed in order to investigate the underlying reason to this group of students after completed the elective courses.

Results: The study has shown that 91% of students satisfied the selected elective course (4-5 score out of 5), 87.7% of students gave overall satisfying score good (4 to 5 score out of 5) and 88.3% of students agreed that the course should be run repeatedly next year. However, there were small number of negative responses from total 187 students. Four students gave only 2 score out of 5 in their quality of life with various factors. Due to the elective courses had some limitation such as limit number of attended students, some courses had more interested students than the available number leading to 17.3% of students had to register in other courses they did not interest at first. Fortunately, some of them had diverse interesting subject but some were not. Another factor was unsuitable content for medical students in some specific courses.

Conclusion: These results suggested that the coordinators should survey the number of interested students before registration period to provide enough space for all who interested in those elective courses. The contents of courses should be adjusted to be more suitable with medical student following the feedback from previous year.

Keywords: elective courses, medical students, satisfaction, efficiency

Study of Characteristics of Depression in Preclinical Medical Students at Faculty of Medicine Siriraj Hospital

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Background: Depression is one of the most important mental health problems, which has recently been more recognized. Therefore, it is crucial to determine the prevalence and factors associated with depression in order to help identify and prevent depression in the future.

Objectives: To determine the prevalence and associated factors of depression in in preclinical students.

Methods: A cross-sectional study was conducted to find the prevalence of depression using the Patient Health Questionnaire - 9 Thai Version (PHQ-9-Thai) and associating factors including interpersonal relationship, mindfulness, and self-esteem. The study was done on the preclinical student of the Faculty of Medicine Siriraj Hospital. Analysis was done using risk estimation by contingency table and univariate logistic regression.

Results: Of 275 medical students participated in our study, 71 (25.8%, 95%CI 0.207, 0.310) has the PHQ-9 score of 9 or more. Two of the factors are significantly correlated to the PHQ-9 score. The first one is presence of personal counselor or peer support which associated with lower PHQ-9 score (OR=0.395, 95%CI 0.207, 0.751; p=0.004). The second is whether it was the participant's own decision to study in medical school. Students who made their own decision was correlated to a lower PHQ-9 score (OR=0.362, 95%CI 0.159, 0.826; p=0.013). This study revealed that prevalence of depression among medical student are higher than those of general population (18.4%).

Conclusion: From our study, depression is one of the major burdens for medical students. Peer support is one of the protective factor and it wasn't limit to only their friends to support them. Teachers are one of the counselor that students may look for, so having good counseling skill is crucial for helping the student with depression. Academic curriculum that promotes peer support may help to in lowering the problem, but further study should be conducted. Providing adequate information about studying medicine to the parents of high-school students and correct the attitude of other people towards doctor may help reducing the pressure from parents in student's decision to learn what they want.

Keywords: depression, medical education

The Proportion of Medical Students who have an Opinion that Their Studying is affected by Online Learning during COVID-19 Outbreak

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Background: Online learning, a non-face to face model of learning, is currently being used in undergraduate medical education of faculty of medicine, Khon Kaen University. Under the COVID-19 situation, a global outbreak in 2019, this suddenly adopted model may negatively affect those medical students' studying.

Objectives: This study aimed to find a proportion of medical students, who have an opinion that their studying is affected by online learning during COVID-19 outbreak, and their opinions toward this study model.

Methods: This descriptive study is based on a self-answered online-questionnaire. For this study, the estimated sample size (n = 360) is sampled by systematic sampling method from the study population in 4th and 5th year medical student from KKU (n = 553). The collected data were analyzed and presented as proportion, percentages, frequency, 95%CI and p-value.

Results: Response rate is 91.7% (330/360), among them, 58.5% (95%CI, 53.1-63.7) think that their studying is affected. factors that 4th- 5th year students agree that may affect their studying the most are student barrier part which is lacking of motivation in learning (69.4%) and learning-program barrier part which is the inappropriateness between the volume of information and the amount of time available (51.8%).

Conclusion: 58.5% of 4th and 5th year medical students think that their studying is affected from online learning model during COVID-19 outbreak. Factors that may affect their studying include lack of motivation in learning, in student barrier part and inappropriateness between the volume of information and the amount of time available, in study model barrier part.

Keywords: Online learning, COVID-19, Medical students

Association between Poorer Examination Scores and Live Lecture Absenteeism among Preclinical Medical Students: a Case-control Study

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Background: Live lecture remains a ubiquitous form of knowledge delivery in preclinical medical education. However, voluntary live lecture attendance has markedly decreased at several medical schools.

Objectives: This case-control study examined the effect of live lecture attendance on academic achievement in selected basic science courses.

Methods: All enrolled second-year (Y2, N=322) and third-year (Y3, N=317) medical students during academic year 2018-2019 were requested to voluntarily participate as a research subject. Total of 372 preclinical students took part in this study and were categorized into cases and controls based on their examination scores. Cases (n=174) were defined as students with below average examination scores, and controls (n=198) were defined as students with above average examination scores. The exposure was absenteeism, which was defined as attending live lecture less than 75% of total live lecture sessions. Second-year and third-year students reported self-estimated frequency regarding live lecture attendance, and they estimated the time spent engaged in various behaviors during live lectures.

Results: Absenteeism was identified as a significant risk factor for having below average score in preclinical medical science courses with a 2.34-fold risk (95%CI, 1.27-4.33). Distracting behavior more than 25% of live lecture time was a factor with non-significantly increased risk for having below average score (1.36-fold risk, 95%CI, 0.86-2.13).

Conclusion: Absenteeism was compellingly associated with poorer examination performance among medical students in basic science medical courses. Preclinical medical students should be encouraged to attend live lectures as often as possible.

Keywords: Live lecture attendance, academic achievement, preclinical medical students

Comparing the Efficacy of Learning between Using or not Using Podcasts along with Traditional Reading and Reviewing Methods among 4th Year Medical Students: a Randomized Controlled Trial

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Background: Fourth year medical students who have limited time, are presented with issues concerning many courses to study along with unique styles if studying. Technology, including podcasts have been crucial in learning due to ease and availability.

Objectives: This study aimed to compare multiple choice question (MCQ) scores between those who learned by podcasts with traditional study and those who only learned by traditional study.

Methods: An efficacy study among all 4th year medical students was conducted at Lampang Hospital. The Stratified blocked of two randomization was done by dividing 39 students into 2 groups which are traditional study (20 students) and podcast listening with reading (19 students), for the assigned 7 topics; 3 topics were in English and 4 Topics were in Thai. The outcome of this study were MCQ scores. Then, results were analyzed by Student's t-test.

Results: MCQ scores of the podcast listening with traditional studying were higher than those who were assigned with only traditional reading (16.21+/-4.22 and 13.90+/-3.92). The p-value of this study was 0.071. However, when looking into the results from the English scores comparing between two groups, those who studied by podcasts had significantly higher scores compared to traditional studying, p-value was 0.013 (7.00+/-2.40 and 5.20+/-1.91).

Conclusion: Podcasts listening with traditional studying had shown in the study to have more efficacy comparing to only traditional studying.

Keywords: podcasting, reading, reviewing, tutoring

Telemedicine by Medical Students in this ERA of COVID-19

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Background: The great outbreak of COVID-19 affected all people. The social distancing and lockdown policies were announced. These lead to problems especially in patients with chronic disease, the non-communicating disease which needs to follow up, and good drug adherence. In a limited resource area as my hospital, there are more than 1,000 patients who need help.

Objectives: To evaluate a telemedicine system using Facebook connection to follow up chronic diseases.

Methods: This study used a Facebook page as telemedicine to connect the patient and medical student together. So the patient can be followed up and receive the drug from the local hospital or post mail and medical student can learn and practice from the real case by staff supervisor.

Results: From March 25, 2020, to April 14, 2020, there were 83 students, and 13 staffs joined this project and total 2,953 patients have participated in telemedicine. Most students were happier on their job and understand more than reading a textbook moreover, they know more about the health system in real life such as health insurance and national drug information which is not in the medical course and building relationships between students to other medical teams. And also the patient appreciated their service also.

Conclusion: The telemedicine by medical students has a benefit to patients and has a positive attitude toward the medical student.

Keywords: COVID-19, Telemedicine, Medical student, Non-communicating disease, Learning beyond classroom

Trends, Prevalence and Associated Factors of Obesity among Adults in a Rural Community in Thailand: Serial Cross-sectional Surveys, 2012 and 2018

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Background: Obesity is a principle risk factor that increases the risk of noncommunicable cardiovascular diseases including diabetes, hypertension and atherosclerosis. In Thailand, a 2014 study reported obesity (BMI $\geq$ 25 kg/m^2) in a Thai population aged $\geq$15 years was 37.5%, 32.9% and 41.8% overall and among males and females, respectively.

Objectives: The objectives of this study were to determine trends in the prevalence of obesity among adults residing in a Thai rural community between 2012 and 2018 and to investigate the associations between obesity and behavioral factors.

Methods: Serial cross-sectional studies were conducted in 2012 and 2018 among adults in Na-Ngam rural community using the total design method. In 2012 and 2018, all 627 and 635 individuals, respectively, were interviewed using structured questionnaires related to demographics, risk behaviors, comorbidities and arthrometric measurement. Spot urine was collected by participants and obesity was defined as BMI $\geq$ 25 kg/m^2.

Results: A total of 1,262 adults in Nga-Ngam rural community were included in the study. The prevalence of obesity was 33.9% in 2012 and 44.8% in 2018 (P<0.001). The average BMI increased from 23.9±4.2 kg/m^2 in 2012 to 25.0±4.52 kg/m^2 in 2018 (P<0.001). Obesity was associated with smoking (AORs 0.46; 95%CI 0.31-0.68), instant coffee-mix consumption $\geq$4 cups/week (AORs 1.49; 95%CI 1.06-2.11), higher spot urine sodium level (AORs 1.003; 95%CI 1.001-1.006) and higher number of chronic diseases ($\geq$1 disease AORs 1.66; 95%CI 1.02-2.68, >2 diseases AORs 1.87; 95%CI 1.18-2.98).

Conclusion: Our data emphasized that obesity constituted a serious problem among adults residing in a rural community. A trend in significant increase was found regarding the prevalence of obesity and average BMI in the rural community over 6 years. Effective public health interventions should be provided in the community to reduce BMI. The modifiable risk factors for obesity should be attenuated to inhibit the progression of metabolic syndrome, noncommunicable diseases and their complications.

Keywords: obesity, prevalence, associated factors, rural community

Association between Primary Knee Osteoarthritis and Cardiovascular Risk Factors in Rural Area of Thailand

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Background: Knee osteoarthritis (OA) is a common disease with high prevalence in Thailand. Many risk factors have been studied worldwide; however, there is a lack of evidence about cardiovascular (CV) risk factor in Thailand.

Objectives: This study was conducted to investigate the association between knee osteoarthritis and cardiovascular risk factor; furthermore, we aimed to estimate the prevalence of knee osteoarthritis in Thai rural area.

Methods: A total 477 participants aged 40 years or older who resided in Ban Na-ngam and Ban Nayao, Tambon Thakradan, Sanam Chai Khet District, Chachoengsao Province were included for analysis. Knee osteoarthritis patients were defined as participants with Kellgren and Lawrence System (K-L) grade ≥2 on knee radiography regardless of knee pain, classified into 3 categories – grade 2 (mild), grade 3 (moderate), and grade 4 (severe). The Thai version of Western Ontario and McMaster Universities Arthritis Index (WOMAC) was used to evaluate the severity of knee osteoarthritis in every participants. The cardiovascular risk was evaluate by Thai CV risk score. The association between Thai CV risk score, WOMAC score, and knee osteoarthritis was analyzed, adjusting for various covariates.

Results: Prevalence of knee osteoarthritis in Na-Yao and Na-Ngam aged ≥ 40 was 43%. Prevalence of knee osteoarthritis is significantly higher in participants with moderate CV risk (Crude OR = 2.08; 95%CI, 1.22-3.56) and high CV risk (OR = 3.61; 95%CI = 1.79-7.25). In those with moderate CV risk, prevalence of the participants with Grade 3 K-L was significantly higher than those with Grade 0-1 K-L (OR = 2.812; 95%CI, 1.513-5.229) and prevalence of Grade 4 K-L was also significantly higher (OR = 5.463; 95%CI, 2.231-13.376). In those with High CV-risk, prevalence of the Grade 3 K-L was significantly higher than those with Grade 0-1 (OR = 3.545; 95%CI, 1.597-7.872) and prevalence of Grade 4 K-L was also significantly higher (OR = 16.309; 95%CI, 6.196-42.931).

Conclusion: In the present study, CV risk identified by Thai CV risk score was significantly associated with knee osteoarthritis.

Keywords: Knee osteoarthritis, cardiovascular risk, associated factors

Association of Electronic Media Usage on Development of Preschoolers' Age 3-6 Years in Rural Communities, Thailand

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Background: The factors influencing over childhood development have both positive and negative ways. Maternal factors found that a first-time mother, whose age is below 18, risks low birth weight. A mother with underlying disease and pregnancy complication directly affects childhood development. Nutritional status, alcohol consumption, and family socioeconomic status are also associated with development of a child. Another factor affecting children development is playtime with parents, especially storytelling. Leaving a child with the television on his or her own can cause a delay in speech development.

Methods: Using cross-sectional descriptive and analytical study with 233 participants to investigate the prevalence of preschoolers age 3-6 years with suspected developmental delays in 4 aspects including personal-social, fine motor, gross motor and language skills and to determine the association between several factors, electronic media usage and children development.

Results: The prevalence of suspected developmental delays in 4 aspects including personal-social, fine motor, gross motor and language skills were 14.7, 15.5, 5.1, and 43.1%, respectively. Multivariate analyses of personal-social and language skills were performed and associated factors were female (AOR, 0.290; 95% CI, 0.108-0.777; p=0.014), School C (AOR, 0.043; 95% CI, 0.005-0.369; p=0.004), School D (AOR, 0.133; 95% CI, 0.043-0.413; p<0.001), family monthly income (AOR, 2.477; 95% CI, 1.195-5.135; p=0.015) and smartphone use (AOR, 0.306; 95% CI, 0.122-0.766; p=0.011).

Conclusion: The prevalence of suspected developmental delays in rural community setting was currently high. Teaching methods, classroom environment and number of teachers in schools were probably modifiable factors. Further study should be designed to discover some teaching strategies to improve the developmental delay in personal-social skill in this community.

Key words: Childhood development, Electronic media use, Prevalence, Rural community

The Relationship between Diarrhea Patients and Fecal Coliform of Ice Samples in Mueng Narathiwat from February to July 2019

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Background: Diarrhea is still one of common public health problems in Narathiwat Province. The most important cause of the diarrhea occurs via contaminated food and drink which included contaminated fecal coliform in ice. The fecal coliform is a bacteriological indicator for food and water safety.

Objectives: The research objective was to identify the relationship between amount of fecal coliform in the ice and diarrhea patient in Narathiwat Province period from February to July 2020.

Methods: The amount of coliform, fecal coliform and *E.coli* was monitored in 10 ice samples of 10 shops with 5 tube-most probably number methods every month for 6 months.

Results: The result was found that just only IS9 has the amount of all bacteriological indicator less than or equal 2 MPN/ml, that were passed through the standard water system in a sealed package for 5 of 6 months and the other ice samples have the amount of all bacteriological indicator more than or equal 2 MPN/ml. When the average number of fecal coliform and the number of patients with diarrhea during the range of months that is studied to analyze the relationship by Pearson correlation showed that there was a very consistent relationship (rp = 0.931).

Conclusion: As a result, the amount of fecal coliform in ice may be one of the risk factors for diarrhea in Mueng District, Narathiwat.

Keywords: diarrhea, fecal coliform, ice, Narathiwat

Prevalence and Factors Related to Underweight of Children Aged 2-4 Years Old at Child Care Centers of Wiang Subdistricts, ChiangKhong District, Chiangrai Province

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Background: Underweight is an important problem among preschool age children which mostly related to undernutrition. Since nutritional problems in children living at the border of Thailand may be different from those living in the city, a survey to identify the prevalence land associated factors is needed.

Objectives: To determine the prevalence and factors associated with underweight in children aged 2-4 years living in ChiangKhong district, Chiangrai province

Methods: We conducted a study in children attended at 6 child care centers in Wiang subdistrict, ChiangKhong district, Chiangrai province. The child's current weight and height were reviewed from a growth record program. Parents responded to a questionnaire about nutritional knowledge and practices. Descriptive statistics was used to analyse population characteristics. Comparison between groups were analysed by using Chi-Square test or Fisher's Exact test as appropriate.

Results: One hundred and seventy children were enrolled. There were 52 (30.59%), 112 (65.88%) and 6 (3.53%) children classified as underweight, normal and overweight, respectively. Hill tribe was only factor associated with underweight of children. Parents of normal or overweight children had some knowledge better than those of underweight children including the importance of breakfast, daily milk drinking, meat and egg diet and having seasonal fruits instead of sweets or snacks. Accordingly, normal or overweight children received more appropriate daily nutrition when compared to underweight children including breakfast, fruit, meat, egg and iron-rich foods.

Conclusion: Nutritional knowledge and practices are important factors related to growth in children living at ChiangKhong district, Chiangrai province.

Keywords: Underweight, Day care center

Prevalence and Associated Factor of Internet Addiction among Population-based Sample of Secondary School Students in Rural Community, Thailand

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Background: Over the past 10 years, technology has greatly progressed and Internet has become more accessible and an indispensable aspect of our lives. The number of internet users has dramatically risen over the last decade. Although it provides convenience, it can also cause negative outcomes. Internet addiction (IA), psychiatric disorders caused by internet abuse, have become much more common throughout the world. However, the prevalence of internet addiction among adolescents has not been reported using a large sample in rural community of Thailand.

Objectives: To clarify the actual status of addictive Internet use among, this study aimed to evaluate the prevalence and the factors associated with internet addiction among secondary school students in rural community of Thailand.

Methods: Cross sectional study was performed during December 2017 to January 2018 among 12 secondary schools in Chachoengsao Province, Thailand. Participants completed a standardized questionnaire on their activities and factors related to Internet use. Multivariable logistic regression analysis was used to identify potential risk factors for internet addiction.

Results: A total of 4,986 undergraduate students were enrolled into the study. Of those 1559 (33.2%) had internet addiction. Addicted Internet users were younger, more likely to be males and failed the exam compared to non-addicted Internet users. Internet addiction was significantly associated with failed exam (OR=1.25), online sex seeking (OR=1.74), school bullying perpetrator (OR=1.49), alcohol used (OR=1.49), recreational drug used (OR=1.87), depression (OR=1.68), anxiety (OR=1.66), stress (OR=1.80), and type of school (private/public school) (OR=1.75) after controlling for gender, school victimization, family restriction internet use, cyber victimization, and cyber perpetrator.

Conclusion: Internet addiction is a new public health concern of young adults. We found the high prevalence of internet addiction among secondary school students in rural community of Thailand. It is found to associate with various risky behaviors and psychological symptoms. Results from this study can be used to help educational agencies and mental health organizations create policies and design programs that will help in the prevention of internet addiction in adolescents. Strategies should address this phenomenon with attention to specific needs of gender while managing psychological disturbances.

Keywords: Internet addiction

Prevalence and Associated Factors of Depression among the Secondary School Students in Rural Communities, Thailand

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Background: Depression is a common condition and shows significantly prevalent in particular groups/conditions depending on gender, ethnicity, age, childhood adversity, rural residential, family mayhem, drinking alcohol, stressful life events and various social factors. Depression is the leading cause of undermining of the quality of life. From previous studies, Years lived with disability (YLD) and Disability adjusted life years (DALYs) of major depressive disorder was 8.2% (5.9-10.8) of Global YLD and 2.5% (1.9-3.2) of Global DALYs.

Objectives: This study aimed to assess the prevalence of depression and the factors associated with depression in secondary school students in rural communities, Tambon Tha Kradan, Amphoe Sanam Chai Khet, Chachoengsao and Tambon Phra Phloeng, Amphoe Khao Chakan, Sa Kaeo.

Methods: A cross-sectional study was conducted in secondary school students in rural communities of Thailand in 2018. A standardized questionnaire was used to collect their demographic information. PH9Q was used to assess students' depression.

Results: The prevalence of depression among the secondary school students in rural communities was 27.9% (males: 41.1%; females: 58.9%). Depression was associated with parental marital status, family conflict, having girlfriend or boyfriend, playing music, playing game, feeling unloved by friends and teachers and the specific time of social media used.

Conclusion: In these rural communities, the depression in secondary school students was associated with relationship problems and spending time for playing music, game and social media. These conditions might be helpful for early detecting the depression in the students.

Keywords: prevalence, depression, rural area, family conflict, social media used

Prevalence of Stress and Its Associated Factors, an Online Study of Mae Fah Luang University Preclinical Year Medical and Dental Students during COVID-19

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Background: COVID-19 pandemic had greatly impacted on academic areas via the lockdown, altered the regular classes attended at the universities including the examination with online classes. The medical and dental students commonly have stressed due to their exhausting curriculums. (This study aims to acknowledge the prevalence of stress and factors associated with stress on online classes among these preclinical students during COVID-19.

Objectives: To find the prevalence of stress and its associated factors among medical and dental students of Mae Fah Luang University among preclinical years upon the online study as a consequence of the lockdown from COVID-19.

Methods: A cross-sectional study collecting data via online questionnaires consisted of 3 parts; demographic, factor associated and ST-5 stress test, conducted from 31th July to 15th August. The measurement of association is analyzed by multivariable logistic regression.

Results: 129 respondents are collected. 53 people (p-value = 0.590) at average 20.53 years old are stressed .Due to stressed students, 41.51% and 58.49% of medical and dental students (consequently) are stressed and the stressors includes inappropriate or unfacilitated location for studying (p-value = 0.001 ; odd ratio = 4.34 ; 95 %CI =1.88-10.03), feeling isolated or lonely (p-value = 0.001 ; odd ratio = 5.07 ; 95%CI = 1.93-13.28) and daily life changes (p-value = 0.001 ; odd ratio = 6.05 ; 95%CI = 2.13-17.16).

Conclusion: The prevalence of stress among medical students and dentists was found that medical students had 37.93% and dental students had 43.66% of stress. The associated factors were categorized into 3 terms: education, learner and others physical are associated factors affecting the stress of pre-clinical medical and dental students of Mae Fah Luang University.

Keywords: Stress-related, COVID-19, medical students, dental students, Online class

Incidence and Risk Factors of Type 2 Diabetes among the Royal Thai Army (RTA) personnel: a Retrospective Cohort Study

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Background: Type 2 diabetes (T2D) has been a rising global burden with increasing prevalence, particularly in rapidly developing countries.

Objectives: This study aimed to determine the incidence of T2D and its risk factors in the Royal Thai Army (RTA) personnel.

Methods: A retrospective cohort study was conducted using 3-year annual health examination record of the RTA personnel. Incidence rate and risk factors of T2D were analyzed.

Results: Annual health examination data from 27,508 military personnel during 3 years period were collected. Incidence rate of T2D overall was 1.75 per 100 person-years, with 1.83 and 1.35 per 100 person-years for male and female, respectively. The independent risk factors for T2D were; age (in increment of 5 years from the age of 35 years onward), increased Body Mass Index (BMI) by Asian-Pacific classification, increased blood pressure (systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg), raised triglyceride (TG) level ≥ 150 mg/dL, raised alanine aminotransferase (ALT) level ≥ 40 U/L, and smoking habits (any exposure to smoking behavior compared to non-smoker) when additionally adjusted for geographic region, gender, and exercise habits.

Conclusion: This study demonstrates increased incidence rate of T2D from previous studies in Thailand, in overall and both genders. The data presents BMI, blood pressure, TG, ALT, and smoking habit as modifiable risk factors for T2D in military personnel. Therefore, interventions to reduce degree of obesity and control blood pressure, together with addictive substances cessation, particularly smoking, could be implemented to decrease the incidence of T2D.

Keywords: type 2 diabetes, military personnel, annual health examination, body mass index, retrospective cohort study

Prevalence, Infection Intensity and Risk Factors of *Opisthorchis viverrini* Infection in Rural Area of Central Thailand

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Background: *Opisthorchis viverrini* (OV) infection is a food-borne trematode infection through the consumption of uncooked cyprinoid fish containing infective stage, metacercariae. Adult flukes are living in hepato-biliary system. Infected cases could be unaware of the infection because of asymptomatic clinical presentation and chronic infection is strongly associated with cholangiocarcinoma which IARC has declared OV to be carcinogenic to human. In Thailand, uncooked cyprinoid fish is popular in the North and Northeastern region as a traditional dish especially Koi pla (Chopped raw fish mixed with spicy herbal ingredients).

Objectives: To evaluate prevalence, infection intensity and risk factors of *Opisthorchis viverrini* (OV) infection.

Methods: The study was conducted in Phra-plerng subdistrict located in Sa Kaeo Province, Central Thailand in 2015 using cross-sectional design. The study areas are combined of Central and Northeastern descendants. Stool specimen was examined with 3 methods; direct smear, modified Kato-Katz and FECT aimed to measure prevalence and intensity of OV infection. Infection intensity was measured as EPG (eggs per gram) and risk behaviours were assessed by questionnaires. Zero-inflated model was used for zero-excess data from EPG.

Results: Study areas comprised of 5 villages with 1,267 participants. Overall prevalence of OV infection was 9.4%. The prevalence was significantly higher in Village Moo 9 ($p < 0.001$) where most of villagers are Northeasterners. Male gender increased risk of acquiring infection (OR = 2.8, 95% CI: 1.1 – 7.5). Infection intensity showed overdispersion with mean EPG = 3.2 and SD = 28.1.

Conclusion: Zero-inflated negative binomial model showed that male gender, increasing age and Koi pla consumption were associated with increasing EPG ($p < 0.05$).

Prevalence and Associated Factors of Traditional Bully among Population-based Sample of Secondary School Students in Rural Community, Thailand

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Background: The bullying problem in schools is well-known to students, teachers, educational personnel and parents. Traditional bullying in school is a new public health concern of adolescents. However, the study of traditional bullying in Thailand is still limited.

Objectives: The objective of the study was to determine the prevalence and associated factors of traditional bullying perpetrator and victimization among secondary school in Chachoengsao Province, Thailand.

Methods: Cross sectional study was performed during December 2017 to January 2018 among 12 secondary schools in Chachoengsao Province, Thailand. Participants completed a standardized questionnaire on their activities and factors related to traditional bullying. Multivariable logistic regression analysis was used to identify potential risk factors for traditional bullying.

Results: A total of 4,928 secondary school students were participated into the study. Of those 1592 (32.31%) reported as being traditional victimization, 1506 (30.56%) reported as being traditional perpetrator and 1,180 (23.94%) reported as being dual perpetrator and victimization. Victim was significantly associated with male (OR=1.79), internet addiction (OR=1.214), cyber-bullied (OR=2.65), cyber-bullying (OR=2.062), control using internet (OR=1.31), private school (OR=1.41), GPA < 3.00 (OR=0.784), GPA 3.00-3.50 (OR=0.645), anxiety (OR=1.25), and stress (OR=1.368) after controlling for non IVDU, alcohol usage, smoking, depression and living with parents. Perpetrator was significantly associated with male (OR=2.03), internet addiction (OR=1.5), non IVDU (OR=1.7), alcohol usage (OR=1.3), smoking (OR=1.41), cyber-bullied (OR=1.72), cyber-bullying (OR=3.63), private school (OR=1.42), GPA < 3.00 (OR=0.780), GPA 3.00-3.50 (OR=0.749), and anxiety (OR=1.31) after controlling for depression, control using internet, stress, and living with parents. Both victim and perpetrator was significantly associated with male (OR=1.63), internet addiction (OR=1.43), alcohol usage (OR=1.23), cyber-bullied (OR=1.89), cyber-bullying (OR=3.11), control using internet (OR=1.26), private school (OR=1.41), GPA <3.00 (OR=0.72), GPA 3.00-3.50 (OR=0.7), and anxiety (OR=1.5) after controlling for non IVDU, smoking, depression, stress and living with parents.

Conclusion: Our study indicated that the traditional bullying is high prevalence, with the result we provide evidence that there were association between traditional bullying with various factors. Further research is needed to find the mechanism of perpetrator and more specific factor that cause to increase the prevalence of traditional bullying, and to investigate the correlation of internet addiction with traditional bullying.

Keywords: bullying, prevalence, associated factors, secondary school

What should I Do if a Child is Choking?: a YouTube Content Analysis

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Background: There is a rapid increase in the development of medical YouTube videos by a number of agencies because it can be easily disseminated. YouTube has become one of the largest social media resources for medical information even life-saving skills. This calls for the need to understand how reliable these resources are for providing life-saving medical information including five back blows five chest trusts method for resuscitating a choking child.

Objectives: To determine reliability and accuracy of how to save chocking child under 1 year or five back blows five chest trusts method on YouTube

Methods: This study was a cross-sectional mixed method design. The YouTube website was searched for videos in English, uploaded between July 2015 and July 2019, using the following keywords: "first aids for chocking," "chocking infant," "chocking child," and "five back blows five chest trusts." First 30 videos, each search term, were seen by two independent researchers to evaluate as they are consistent with five back blows five chest trusts method. The data collected in the study included sources, the duration time, the number of viewers, the number of likes, and dislikes. The videos were scored if they demonstrate five back blows five chests method in full accord with AHA Resuscitation Guidelines.

Results: A total of 120 YouTube videos were retrieved; 22 were eligible for content analysis. More than 70% were professional videos; the majority showed important skills for demonstrate five back blows five chests method in full accord with AHA Resuscitation Guidelines (Median score of the videos is 75%). Non-professional videos had been posted a significantly shorter duration than professional videos (7.4 minutes vs 13.5 minutes, p = 0.01) and were more reliable (p < 0.005). Duration time, the number of like and dislike were not show any significant effect on the reliability scores.

Conclusion: Most of the information on YouTube pertaining to five back blows five chests method from professional source is accurate. YouTube is one of an alternative choice for seeking medical knowledge and skills. It has a potential benefit for parents or medical students who want to prepare or help a chocking child.

Keywords: choking, children, YouTube, reliability, accuracy

Comparison of Reinfection Rate in Head Louse Infestations after Permethrin Shampoo Treatment between School-based and Community-based Setting in Rural Areas of Thailand

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Background: WHO still recognized head louse as one of the most common parasitic infections worldwide, despite public health measures. Thus, this study aims to compare the reinfection rate of Pediculosis capitis after administration of 1% Permethrin shampoo in school-based and community-based settings in rural areas of Thailand at 1 month.

Objectives: This study aimed to compare the reinfection rate of Pediculosis capitis after administration of 1% Permethrin shampoo in school-based and community-based settings in rural areas of Thailand at 1 month.

Methods: For the community-based setting, all participants were over 3 years old. For the school setting, our target group is grade 1-6. Participants eligible must have Pediculosis capitis and must not have cut or dyed their hair or perform other treatment for it three months prior to the trial. After the informed consent process, all participants get interviewed about factors associated with the Pediculosis capitis. Then, most participants were screened for head lice infestation by direct technique and wet comb technique by trained researchers. After that they got the standard treatment for lice that is the 1% Permethrin shampoo twice 1 week apart by self-administration. Except for the school where we administered the first Permethrin treatment and reassess for efficacy.

Results: Efficacy of Permethrin shampoo from the school-based group is about 95%. For the other groups, reassessment was done by community health volunteers around 1 day after their second shampoo and the effectiveness of Permethrin shampoo was around only 59%. Due to the COVID-19 situation, researchers were not able to enter the area. The reinfection rate was reassessed by phone or by community health volunteers. After 1 month the reinfection rate of Pediculosis capitis in school-based settings is around 17%, while there is no reinfection in the community-based setting. Although, during this time the students did not go to school.

Conclusion: The reinfection rate of head louse infestation after Permethrin shampoo treatment in school-based setting is higher than community-based setting. There might be a chance these school children got lice from people in their home. However, the reinfection would need to be assessed as planned for a stronger conclusion.

Keywords: head louse infestation, permethrin shampoo, reinfection rate, school-based, community-based

Prevalence and Associated Factors of Substance Abuse among Adolescents in Rural Communities, Central Thailand: a Cross-sectional Study

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Background: Substance abuse is one serious social challenges that has continued to increase over a long period. This is a major problem currently affecting society, the economy and national development. One related study conducted in southern Thailand found that the prevalence of substance abuse in youth groups was 7% in 2002 increasing to 9% and 13% in 2003 and 2004, respectively. Nevertheless, information regarding substance abuse among adolescents in Thailand remains limited especially in remote rural communities.

Objectives: The study aimed to determine the prevalence and associated factors concerning substance use among adolescents in rural communities, Central Thailand.

Methods: The present study was conducted in 2 secondary schools in rural communities, Chachoengsao and Sa Kaeo Provinces, Central Thailand. A cross-sectional quantitative study identified the prevalence and associated factors of substance abuse among adolescents. A standardized questionnaire with self-reported was used to collect data including demographic characteristics, history of substance abuse and associated factors. Multivariate analysis was performed to adjust confounders using logistic regression analysis.

Results: The sample size of the study totaled 652 adolescents. The lifetime prevalence of substance abuse was 24.4%, while the one-year prevalence of substance abuse was 16.7%. After adjusting for potential confounders, the risk factors associated with substance abuse among adolescents within the last year were: being male (AORs = 2.19; 95%CI, 1.16-4.16), friend inducement (AORs = 3.28; 95%CI, 1.64-6.55), smoking (AORs = 3.22; 95%CI, 1.50-6.90) and alcohol consumption (AORs = 4.46; 95%CI, 2.43-8.16).

Conclusion: Our data emphasized that substance abuse was a problem in these rural communities. Public health interventions aimed to prevent substance abuse among adolescents should be designed and provided for these rural communities. Further, schools should provide lessons on how to negotiate and avoid coercion when being induced to abuse substances or engage in other unhealthy and dangerous conduct.

Keywords: substance abuse, prevalence, associated factors, rural community

Homeopathic Remedy in Anxiety Disorders and Postoperative Pain

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Background: The world's citizens are facing anxiety crisis. Anxiety disorders have been widely prevalent throughout all ages. A number of their treatments were introduced such as the Cognitive Behavioral Therapy (CBT) or intaking of the Selective Serotonin Reuptake Inhibitors (SSRIs) and other drugs. However, by the CBT, the processes are as long as 20 weeks duration, while the SSRIs unavoidably result in various unwanted side effects and concerns about drug dependency on the patients. Because of those reasons, alternative medicine is another interesting option to turn to. The most effective and safest one is Homeopathy.

Objectives: The study aimed to study, analyze, and conclude the efficacy of the homeopathic remedy. More specifically, to prove that Aconite (Aconitum napellus) perfectly enacts as the main ingredient of anxiolytic homeopathic medicines.

Methods: The author reviewed 11 published pieces of literature both quantitative and qualitative research from (Alibeu JP., 1990), (Davidson JR., 1997), (Bagherian M., 2014), (Abbasi W., 2017), (AAHP, 2018), etc. Going through the randomized and double-blind experimental design research, they classified the samples into two groups – one was treated with homeopathic medicines of Aconite extract at the standard level of 30C, and the other was treated with placebo. The Spielberger State-Trait Anxiety Inventory (STAI) and the patients' reports were evaluating tools.

Results: From the research, the homeopathic remedy made the patients completely recovered within 3-4 weeks after being cured and present at the follow-up consistently. The studies also found that not only does the extract of Aconite alleviate acute anxiety, it as well has the potential to relieve pain from acute injuries, fever, and postoperative pain in children. The postoperative pain and agitation in children recovered with speediness as well as efficiency.

Conclusion: According to the findings, the homeopathic remedy of Aconite can dramatically lessen the symptoms and heal anxiety in a shorter period than modern medicine. Nevertheless, there is currently no research proving the symptoms' recurrence and medicines' toxics, thereby future researchers are encouraged to conduct more diverse designs to clarify. Plus, there ought to be other experiments to discover other anxiolytic homeopathic herbs that can suitably grow in different areas over the world.

Keywords: Anxiety Treatment, Postoperative Pain, Homeopathy, Aconite, Alternative Medicine

Assessment of Environmental Cleaning for Patient with Antimicrobial-resistant Infection in Chonburi Hospital

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Background: Antimicrobial resistance (AMR) is the important public health threat with remarkable cost to global economy. Chonburi Hospital had AMR bundle of care policy but the infection rate of AMR is still striking which 47.8% of the microbial infections were caused by the organisms colonizing. Contact transmission from health care workers and visitors takes role to this issue. Daily cleaning and terminal cleaning of environment are the preventive measures to reduce the microbial colonization and transmission.

Objectives: To assess the environmental cleaning for patients with AMR infection in Chonburi Hospital.

Methods: We performed a prospective descriptive study to estimate the percentage of the remained invisible fluorescent cream which was apply on the high-touch surfaces of AMR infection patient environments before the daily cleaning in general wards and ICU. The spread of the cream to other surfaces inside and outside patient areas after 24 hours and 7 days were also noted.

Results: Four hundred and eighty samples of high-touch surfaces from 94 beds were included. More than 50% of the cream still remained in most wards after 24 hours. The devices which were far from patients had the number of cream left such as IV pole (54.7%), infusion pump (68.6%) and ventilator (85.2%). We found the spread of the cream to other surfaces inside and outside of the patient areas 4 and 8 surfaces respectively. Most general wards could not completely provide the ready to use devices.

Conclusion: Incomplete cleaning of the cream and touches of high-touch surfaces without hand washing contribute to its spreading within the room. The quality of the environmental cleaning should be improved to reduce the microbial colonization. Hand hygiene and the AMR bundle of care should be paid more attention to decrease the transmission of antimicrobial resistant organism.

Keywords: Antimicrobial resistance, Environmental cleaning

Prevalence and Associated Factors of Successful Smoking Reduction among Patients at Smoking Cessation Clinic of Thawung Hospital, Lopburi, Thailand

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Background: Recently, Thailand has made progress on tobacco control in many ways such as restricted law, prohibition of selling tobacco to persons who are under the age of 18. However, the number of smokers in Thailand were still so high and people continued to die from smoking related diseases. The past studies showed that many smokers try to quit smoking but not succeed due to many factors. So, the smoking reduction may be more achievable goal for them. Once the smoking reduction is encouraged, it can lead to further effort to achieve cessation. So, the objective of this study is to find the associated factors of smoking reduction that will be used to develop further interventions to encourage people to reduce smoking and may lead to complete smoking cessation in the future.

Objectives: To investigate the prevalence and associated factors of smoking reduction among patients of smoking cessation clinic, Thawung Hospital, Lopburi, Thailand.

Methods: A quantitative, cross-sectional study was conducted between 2017 to 2020 to investigate the prevalence and associated factors of smoking reduction among patients at smoking cessation clinic Thawung Hospital, Lopburi Province, Thailand. The data were collected from case record form and hospital database of smoking cessation clinic of Thawung Hospital. The study was reviewed and approved by the Institutional Review Board, RTA Medical Department.

Results: There were 96 patients participated in this study. Most of the participants were male patients. The prevalence of smoking reduction among patients at smoking cessation clinic was 72.9%. The significant factors associated with smoking reduction were the number of visits at smoking cessation clinic ($p = 0.008$) and being in preparation stage from stage of change model ($p = 0.05$).

Conclusion: This study showed that the frequency of visit at the clinic affect the success of smoking reduction so intervention program should be developed aiming to increase the participants and follow up rate of patient attending this clinic. Stage of change is also an essential method to evaluate the patient mind and motivation in order to choose the proper interventions or treatment for each patient.

Keywords: smoking cessation, prevalence, associated factors

Correlation between Congenital Hypothyroidism and Hearing Loss in Newborn in Uttaradit Hospital

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Background: Congenital hypothyroidism increases the risk of hearing loss which caused delay speech and language development, social and emotional problems, and educational failure. Currently, a universal hearing loss screening program has been implemented in high-risk groups in Thailand in which congenital hypothyroidism is not considered as a risk factor for hearing loss resulting in restricted hospitals that do not be screening hearing loss among congenital hypothyroidism.

Objectives: To determine the correlation between congenital hypothyroidism and hearing loss in newborns in Uttaradit Hospital.

Methods: A retrospective cohort study was conducted using medical records of Uttaradit Hospital.

Results: Newborns with congenital hypothyroidism were 2.5 times significantly greater risk of hearing loss (95% CI 1.27-4.95, p=0.008).

Conclusion: Congenital hypothyroidism affected to hearing loss in newborns. Therefore, hearing loss in newborns should be early screening to reduce the risk of hearing loss and increase the quality of life

Keywords: correlation, congenital hypothyroidism, hearing loss, newborn

The Study of Association between COVID-19 Epidemic and Uncontrolled Blood Pressure among Hypertensive Patients in Thaluang Hospital, Lopburi Province

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Background: In January 2020, there is COVID-19 pandemic which is the public health emergency. Due to COVID-19 pandemic, we would like to determine the association between COVID-19 epidemic and uncontrolled blood pressure among patients with hypertension especially in community hospital setting in Thailand.

Objectives: To determine the association between uncontrolled blood pressure level among patients with hypertension and the COVID-19 pandemic.

Methods: A cross-sectional study was conducted in in Thaluang Hospital, Lopburi Province between 2019 and 2020. Demographic data and blood pressure level of patients with hypertension were retrieved from the electronic medical records after permitted by the head of hospital. The data was divided into 2 parts including in 2019 (normal situation) and in 2020 (COVID-19 pandemic). Uncontrolled blood pressure (BP) was defined by systolic BP $\geq$ 140 mmHg, or diastolic BP $\geq$ 90 mmHg in the last visit. The demographic and prevalence of uncontrolled BP was analyzed by descriptive statistics. The average of SBP and DBP of patients with hypertension between in normal situation and COVID-19 pandemic were compared and analyzed by independent t-test.

Results: There were 4,045 and 4,063 patients with hypertension visited in Thaluang Hospital in 2019 and 2020, respectively. The prevalence of uncontrolled BP among patients with hypertension was 28.0% and 25.0% in normal situation and COVID-19 pandemic period in 2020 (p = 0.003), respectively. The average SBP was 132.87 mmHg and 132.94 mmHg in 2019 and 2020 (p<0.05). The average DBP was 74.96 mmHg and 75.63 mmHg (p<0.05). The factors associated with uncontrolled BP both in 2019 and 2020 was higher body mass index (BMI) (p<0.05).

Conclusion: In 2020, the prevalence of uncontrolled BP was lower than that in 2019. The Thaluang OPD NCDs policy that delivery the medication to NCDs patients at their home during the pandemic of COVID-19. However, the obesity among patients with hypertension should be prevented to reduce the blood pressure level which may inhibit its complications in the future.

Keywords: COVID-19, uncontrolled blood pressure, body mass index, community hospital

Effectiveness of Alcohol Rehabilitation Program to the Reduction of Drinks a Day in Phaya Mengrai Hospital: Secondary Data Analysis

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Background: In Phaya Mengrai Hospital, Alcohol is the most used addictive substance even though there is an Alcohol Rehabilitation Program.

Objectives: This study was to determine the effectiveness of the Alcohol Rehabilitation Program of Phaya Mengrai Hospital, which is adapted from I-MAP Health program and MI & MET program, in term of reducing drinks a day.

Methods: A retrospective cohort study was conducted in the patients participating in the Alcohol Rehabilitation Program of Phaya Mengrai Hospital in the 2019 fiscal-year. A total of 68 people were recruited. Secondary data analysis was perfomed using medical record of Phaya Mengrai Hospital.

Results: After joining the Alcohol Rehabilitation Program of Phaya Mengrai Hospital with presenting in all the follow-up appointments at 1, 2, 4, 6, 10, 14, 18, 7 follow ups in total, the patients reduce drinks a day 6.31 standard drinks significantly ($p < 0.001$). When cut off the nuisance variables such as gender, age, occupation, address, married status, underlining disease and psychological underlining disease, the patient has the reduction of drinks a day at 8.21 standard drinks with a statistical significance ($p < 0.001$).

Conclusion: Alcohol rehabilitation program of Phaya Mengrai Hospital has the effectiveness to reduce drinks a day at 8.21 standard drinks when the patients present in all the follow-up appointments.

Keywords: Alcohol Rehabilitation Program, effectiveness, reduction of drink

Satisfaction of Clients with the Home Pharmacy Delivery Services Project of an Outpatient Department at Srinagarind Hospital

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Background: The current COVID-19 pandemic was still in effect as the number of newly reported cases of COVID-19 continued to rise. The Home Pharmacy Delivery Service projects were so established by many hospitals in Thailand, including Srinagarind Hospital, to reduce the risk of COVID-19 exposure.

Objectives: The purpose of this study was to assess the satisfaction proportion and the associated factors among clients who participated in the project.

Methods: A descriptive study was conducted on 2,782 clients who registered for the project in Srinagarind Hospital. The 340 samples were selected using systematic sampling. The research instrument used in collecting the data was an online self-administered questionnaire. The data were analyzed by descriptive statistics to assess frequency, percent, 95% confidence intervals, chi-square test, and odds ratio.

Results: The response rate was 66.5 percent (226/340). The results of the study revealed that the overall satisfaction proportion of clients was 96.0 percent (95%CI, 93.15-98.52). By the most satisfied field was the precision and quality of the delivery service, for 96.5 percent. And the least satisfied field was the expense of the delivery service, for 89.3 percent. The factor affecting client's satisfaction significantly was female (OR = 4.02; 95%CI, 1.04-15.53).

Conclusion: Nine-tenths of the project's clients were overall satisfied with the project and the factor affecting on clients' satisfaction significantly was female.

Keywords: Satisfaction, Home Pharmacy Delivery, Outpatient, Srinagarind Hospital

Effect of Maternal Anemia in Various Trimesters on Term Low Birth Weight Infants in Phrae Hospital: a Retrospective Cohort Study

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Background: Many studies have shown that anemia during pregnancy increases the risk of low birth weight in infants. Some studies reported that this relationship may be different with respect to trimesters of pregnancy; however, the findings are heterogeneous because of complex physiology of anemia in pregnancy.

Objectives: To assess the associations between maternal anemia in each trimester and the risk of being low birth weight infants.

Methods: A retrospective cohort study was conducted in department of OB-GYN at Phrae Hospital. Eligible study participants consisted of 542 pregnant women from September 2019 to April 2020. Preterm infants were excluded from the study. We classified exposure into 4 groups: pregnant women who had anemia in 1st, 2nd, 3rd trimester, and women with no anemia during pregnancy (the reference group). Data on birth weight (grams) was retrieved from birth registry at delivery room. Low birth weight (LBW) was defined as birth weight < 2500 grams. Potential confounders such as maternal age, maternal body mass index (BMI), and socioeconomic status were set at priori. We used multivariable logistic regression model as an explanatory analysis to assess the exposure-outcome association and the adjusted odds ratio (OR) and 95% confident interval was reported. All analysis was performed using R Studio ver.4.0.3.

Results: Of 542 pregnant women, 47 (8.6%) had anemia in 1st trimester, 33 (6.1%) in 2nd trimester, 54 (10.0%) in 3rd trimester, and 408 (75.3%) had no anemia. There were differences in baseline prognostic factors between exposure groups such as maternal age, pre-pregnancy BMI, gestational weight gain, visit time at antenatal care (ANC), parity and maternal education. In univariable analysis, OR of being LBW was 2.78 (95%CI: 1.12-6.28) in 1st trimester anemia, 3.47 (95%CI: 1.56-7.03) in 3rd trimester anemia, but the effect was not statistically significant for 2nd trimester anemia. After adjustment for all potential confounders, the effects were similar to those in unadjusted analysis. The OR of being LBW was 3.10 (95%CI: 1.17-7.61) in 1st trimester anemia, 3.43 (95%CI: 1.44-7.83) in 3rd trimester anemia.

Conclusion: Maternal anemia in first or third trimester of pregnancy influences low birth weight in infants born at term. Early detecting for anemia and closed monitoring women in pre-pregnancy period should be advocated as to prevent adverse birth outcomes.

Keywords: Anemia in pregnancy, Low birth weight, pregnancy trimester

Presenting Symptoms in Sepsis: Is the Mnemonic "SEPSIS" Useful?

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Background: The mnemonic "SEPSIS" (S = Slurred speech or confusion, E = Extreme shivering or muscle pain, fever, P = Passing no urine all day, S = Severe breathlessness, I = It feels like you are going to die, S = Skin mottled or discolored) has been developed by the World Sepsis Day committee, so as to raise public awareness of the symptomatic presentation of sepsis. However, this mnemonic has not been validated.

Objectives: The aim of this study was to evaluate presenting symptoms of septic Thai patients compared with the mnemonic SEPSIS.

Methods: A retrospective, observational, single-center study was performed. All adult septic patients presenting at the emergency department of Songklanagarind Hospital from 2016 to 2019 were included and followed up until either hospital discharge or death.

Results: The study included 437 patients, comprising patients with sepsis (n = 250) and those with septic shock (n = 187). Patients presented with symptoms according to the mnemonic as follows: S = 97 (22.2%), E = 240 (54.9%), P = 18 (4.1%), S =181 (41.4%), I = 5 (1.1%), and S = 5 (1.1%). Sixty-five patients (14.9%) did not present with any sepsis-specific symptoms according to the mnemonic. Compared with patients who had at least one mnemonic symptom, a higher proportion of patients without mnemonic symptoms had underlying immunosuppression (24.6% vs 8.3%, p<0.01) and were diagnosed with intraabdominal infection (38.5% vs 12.1%, p<0.01). In a multivariable adjusted logistic regression model, vague-presenting symptoms were independently associated with in-hospital mortality (AOR = 2.17, 95% CI, 1.30−3.61, p=0.03).

Conclusion: Two components of the mnemonic "SEPSIS" were rarely reported: it feels like you are going to die and skin mottled or discolored. Using the mnemonic might lead to missed diagnoses, especially in immunosuppression and intraabdominal infection. This mnemonic should be revised for the local context.

Keywords: sepsis, symptom, mnemonic

Differences in Rates of Non-traumatic Hip Fractures in Patients with End-stage Renal Disease at Phrae Hospital

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Background: Previous studies have shown that non-traumatic hip fractures tend to occur in end-stage renal failure (ESRD) patients. The global incidence of hip fractures in ESRD patients is 3.89/1,000 person-years. The various types of kidney replacement therapy (RRT) such as hemodialysis, peritoneal dialysis may reduce the hip fracture rate. We hypothesized that ESRD patients receiving either type of dialyses had lower hip fracture rates than those without RRT.

Objectives: To compare the rate of non-traumatic hip fracture in ESRD patients undergoing hemodialysis, peritoneal dialysis and non-RRT, and to assess the association between RRT and the rates of non-traumatic hip fracture.

Methods: A retrospective cohort study was conducted in the CKD clinic, hemodialysis and peritoneal dialysis unit at Phrae Hospital. We included 1,765 first-diagnosed ESRD patients from January 2014 to December 2016. Patients were divided into 3 groups: hemodialysis (n=252), peritoneal dialysis (n=156) and non-RRT (n=1,357; the reference group). Non-traumatic hip fracture was reported by radiologists and the data was retrieved from hospital e-records. All patients had been followed up for 3 years. We compare the difference in rates of non-traumatic hip fracture using multivariable Poisson regression and compare hip fracture-free time between groups using the Kaplan-Meier method. Cox's proportional hazard regression was performed to estimate the hazard ratio (HR) of the relationship between types of dialysis and non-traumatic hip fractures.

Results: Of 1,765 ESRD patients, more males (approximately 60%) in both dialysis groups. Mean age (years) was 61.0 (sd=13.7) in hemodialysis group, 57.5 (sd=12.6) in the peritoneal dialysis group and 65.9 (sd=13.9) in the non-RRT group. More than 50% of the patients with co-morbidities e.g., diabetes and hypertension were on hemodialysis or peritoneal dialysis than those without co-morbidities. After adjustment for potential confounders, there was no statistical difference between the hip fracture rates between hemodialysis group (4.81 cases per 1000 person-years) and the reference group (7.38 cases per 1000 person-years). There was no case of hip fracture in the peritoneal dialysis group. The hazard ratio comparing the instantaneous hip fracture rates in the hemodialysis to the non-RRT group was 0.90 (95%CI: 0.21-3.93).

Conclusion: ESRD patients receiving either type of dialysis are more likely to have a lower rate of non-traumatic hip fracture than those without RRT.

Keywords: End-stage renal disease, Dialysis, Hip fracture, Rates

Effectiveness of a Motion Sensor Device to Improve Hand Hygiene Compliance, an Innovation Invented by Medical Students

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Background: Hand hygiene is one of the most important means to prevent healthcare-associated infections. Global efforts have been made to improve hand hygiene in healthcare. However, hand hygiene compliance remains low.

Objectives: To assess the impacts of a motion sensor device in improving hand hygiene compliance.

Methods: A controlled before and after study was conducted during April-May 2018 in 2 medical ICUs of a tertiary care hospital in Bangkok, Thailand. One ICU was assigned to a motion sensor device intervention, another was assigned to hand hygiene day intervention. Hand hygiene compliance was determined pre- and post-intervention through direct observation using surveillance cameras. Descriptive statistics and Student's t-test analysis was performed to identify significant difference between the two groups.

Results: A total of 2,692 opportunities of hand hygiene were observed. After the intervention, higher compliance rates were achieved. Hand hygiene compliance increased significantly ($p<0.01$) from 15.9% to 29.1% in the motion sensor device intervention group, compared with a slight increment from 13.3% to 16.8% in the hand hygiene day intervention group.

Conclusion: The motion sensor device intervention improved hand hygiene compliance significantly, compared to hand hygiene day intervention. However, additional interventions are needed to enhance the results. Long-term evaluation and further work on interactive interventions to improve hand hygiene may prove valuable.

Keywords: hand hygiene, motion sensor device, compliance

Prevalence and Risk Factors of Hyperglycemic Crisis in Diabetic Patients at Sanam Chai Khet Hospital, Chachoengsao Province, Thailand, July 1st, 2015 – July 1st, 2020

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Background: Recently, the Hyperglycemic crisis is the most serious acute complication of diabetes and associated with significant morbidity and mortality in diabetes patients. Importantly, why we should evaluate the prevalence and risk factors of the hyperglycemic crisis in diabetic patients.

Objectives: This study aimed to evaluate the prevalence and risk factors of hyperglycemic crisis in diabetic patients at Sanam Chai Khet Hospital, Chachoengsao, Thailand.

Methods: A cross-sectional study is used in the quantitative method. Population in this study are selected under the condition that they must be diabetes type 2 patient, age 18-year-old above and visit the disease at Sanam Chai Khet Hospital, Sanam Chai Khet District, Chachoengsao Province, Thailand, July 1st, 2015 – July 1st, 2020.

Results: In this study, 5 years-data collected from 2,834 patients who were diagnosed with diabetes mellitus at Sanam Chai Khet Hospital. 2,761 patients (97.4%) have no hyperglycemic crisis, 59 patients (2.1%) developed HHS, and 14 patients (2.1%) developed DKA. No mixed DKA/HHS has diagnosed. The study shows factors associated with diabetic ketoacidosis in diabetes patients as followed. Unspecified diabetes mellitus is 49.54 times more likely to develop DKA than type 2 diabetes mellitus. Current smokers are 4.76 times more likely to develop DKA than patients who quit or never smoking. Patients who were current alcohol drinking are 5.85 times more likely to develop DKA than patients who quit. Patients who have 1-2 comorbidities are 0.11 times less likely to develop DKA than patients who have no comorbidity. The study shows that hyperosmolar hyperglycemic state was associated with chronic kidney disease. Patients with chronic kidney disease are 2.42 times more likely to develop HHS than patients who had no chronic kidney disease.

Conclusion: In this study, the factors associated with diabetic ketoacidosis are unspecified diabetes mellitus, smoking, and alcohol drinking. Comorbidities (1-2 diseases) have a lower risk of diabetic ketoacidosis than no comorbidities. The factors associated with hyperosmolar hyperglycemic state are type 2 diabetes mellitus and chronic kidney disease.

Keywords: hyperglycemic crisis, diabetes mellitus, hyperosmolar hyperglycemic state, diabetic ketoacidosis

Automated ICD-10 Mapping Using Approximate Matching Technique and SNOMED-CT

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Background: In Thai healthcare reimbursement systems, ICD-10 is used for documenting standardized medical terms. Physicians review medical records such as discharge summary notes to map appropriate ICD-10s to claim financial support from the government. However, limited human resources often means ICD-10 documentation is incomplete, missing or uses inappropriate labels

Objectives: We proposed a new computational approach using an approximate matching technique and Systematized Nomenclature of Medicine Clinical Terms (SNOMED-CT) to automate the ICD-10 mapping process to aid physicians in documenting more detailed and accurate ICD-10s.

Methods: We collected 18,159 discharge summary notes from Maharaj Nakorn Chiang Mai Hospital during 2006 to 2016. The notes were pre-processed by removing non-alphabetic and stop words. Then, we mapped SNOMED-CT including findings, abnormalities, disorders and procedures to ICD-10s and calculated Term Frequency-Inverse Document Frequency (TF-IDF). We used a token set ratio approach to compare similarity between the notes and ICD-10s and weighted the similarity by TF-IDF.

Results: Weighted similarity was used to measure the appropriateness of the ICD-10 mapping. Fifty three percent of actual ICD-10s were ranked above the 90th percentile and 80% above the 80th percentile. Ten percent of actual ICD-10s were found below the 50th percentile.

Conclusion: The actual ICD-10s with ranking above 90th percentile were classified as 'highly appropriate' and above 70th percentile as 'appropriate' ICD-10s, while ICD-10s below the 50th percentile were interpreted as 'inappropriate' ICD-10s. Neoplasms, diseases related to cardiovascular systems and injuries were most commonly found as appropriate matches whereas endocrine, hematologic and neurological diseases were disproportionately inappropriate. The terms in actual ICD-10s with high rankings were easily mapped because they uniquely and frequently appeared in the case notes (representing high TF-IDF) while the terms for inappropriate ICD-10s had no specific words and required human interpretation. With the advantage of approximate matching, it improved the mapping result because it tolerated word variations and sequences. TF-IDF enhanced matching accuracy because it weighted the importance of words found in the document. In conclusion, mapping ICD-10s from clinical documents using SNOMED-CT and TF-IDF has potential for use in automating the ICD-10 documentation process.

Keywords: ICD-10 mapping, SNOMED-CT, text mining

Incidence and Associated Factors of Hypoglycemia in Type 2 Diabetes Patients in the Outpatient Department of Bangkhla Hospital, Chachoengsao: a Retrospective Cohort Study

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Background: Diabetes mellitus is a non-communicable disease with significant morbidity and mortality. Antidiabetic agents are used for glycemic control to reduce complications. Patients using antidiabetic agents may sometimes develop hypoglycemia; a potentially dangerous condition. There have been studies on hypoglycemia and its associated factors in the Thai population. However, most studies were cross-sectional studies and were conducted solely in the inpatient department.

Objectives: This study aimed to determine the incidence and associated factors of hypoglycemia in type 2 diabetes patients in the Outpatient Department.

Methods: This retrospective cohort study was conducted using data from the Hosxp database of Bangkhla Hospital during 1st October 2017 - 30th September 2019. 1,381 subjects diagnosed with type 2 diabetes during the 1st July 2017 - 30th September 2017 were identified and baseline characteristics were obtained. The subjects were then observed for 2 years for events of hypoglycemia. A Poisson regression analysis was then performed to determine incidence rate and associated factors.

Results: Sixty of 1,381 subjects developed hypoglycemia during the study. Incidence rate was 31 per 1000 person-years. The factors associated with hypoglycemia were age>65 years (IRR 2.6), BMI 22.9-27.9 (IRR 0.5), hypertension (IRR 0.6), sulfonylurea monotherapy (IRR 3.0), pioglitazone monotherapy (IRR 19.4), taking pioglitazone with sulfonylureas (IRR 8.3), combined use of metformin sulfonylureas and pioglitazone (IRR 4.7), using only insulin (IRR 7.9), taking oral antidiabetic medication with insulin (IRR 12.7) and having diabetic nephropathy (IRR 1.9).

Conclusion: Incidences of hypoglycemia may vary greatly between countries. Goals of glycemic control in diabetic patients should weigh the risk and benefits tailored for each patient. Although complications may arise if a patient's glycemic control is too loose, the patient might die much earlier from hypoglycemia if glycemic control is too strict.

Keywords: type 2 diabetes, incidence, associated factors, hypoglycemia

Whether the Proposed of New Pulmonary Hypertension Criteria has an Impact on Pediatric and Adolescent Patients?

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Background: According to the 6th World Symposium on Pulmonary Hypertension, there was a new proposed criterion for pulmonary hypertension (PH) diagnosis with the mean pulmonary artery pressure (mPAP) ≥ 20 mmHg instead of ≥ 25 mmHg. Very little data is available for pediatric and adolescent pulmonary hypertension patients whether the diagnostic criteria change would have an impact of patient care.

Objectives: To define whether lower the bar for pulmonary hypertension diagnosis would increase the number of pediatric and adolescent patients and change their management.

Methods: Retrospectively review of the previous cardiac catheterization record, the data was sourced out and defined the PH cases base on the existing criteria versus the newly proposed criteria. The patients were divided into 3 groups according to their mPAP, specifically group A: < 20 mmHg, group B: 20-24 mmHg, and group C: ≥ 25 mmHg.

Results: A total of 85 patients underwent cardiac catheterization for hemodynamic evaluation with complete data record at a tertiary care center specialized in pediatric pulmonary hypertension. Group A composed of 32 patients with mean age of 8.95 years and mean mPAP 15 mmHg. There were 8 patients in group B with their mean age of 10.7 years and mean mPAP 21.7 mmHg while their pulmonary vascular resistance < 3 WU.m^2. While 44 patients in group C, mean age 7.41 years, had their mean mPAP 28 mmHg.

Conclusion: With the newly proposed PH criteria, there was 18% increase in number of patients diagnosed with PH in comparison with previous criteria for PH diagnosis. This group of patients, who had mPAP 20-24 mmHg, had pulmonary vascular resistance less than 3 WU.m^2. Therefore, the increase number of patients, due to newly criteria for PH diagnosis did not have a significant impact on patient management in term surgery management or pulmonary vasodilator therapy.

Keywords: pulmonary hypertension, diagnostic criteria, management, number of case

Prevalence and Risk Factors of Diabetic Nephropathy in Type 2 Diabetic Patients at Bangkhla Hospital, Chachoengsao Province

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Background: Non communicable diseases (NCDs) such as heart diseases and stroke, cancer, diabetes and chronic lung diseases are important health problems that Thailand confronts with. NCDs including diabetes account for more than 70% of deaths among all age groups in Thailand. From previous studies, pivotal risk factors for the progression of diabetic nephropathy included uncontrolled blood sugar level, longer duration of diabetes, high blood pressure, obesity and dyslipidemia. Strict blood glucose and blood pressure control using medication and lifestyle modification can reduce the diabetes-related mortality and delay the progression of diabetic nephropathy. This study was aimed to determine the prevalence and risk factors of diabetic nephropathy in community hospital in Chachoengsao Province (Category F2 – 30 hospital beds). The results will be useful for management and control strategies among type 2 diabetic patients.

Objectives: To investigate the prevalence and risk factors of diabetic nephropathy in type 2 diabetic patients at Bangkhla Hospital, Chachoengsao Province during 2015-2020.

Methods: A cross-sectional study investigates the prevalence and risk factors of diabetic nephropathy in type 2 diabetic patients at Bangkhla hospital, Chachoengsao province during 2015-2020. The data were retrieved from electronic medical records of the hospital information system. This study was approved by IRB RTA : R148h/63_Exp.

Results: A total of 3,213 diabetic patients participated in the study, and 807 were diagnosed with diabetic nephropathy, 25.12% of prevalence. Risk factors of diabetic nephropathy are being older than 60 years old, BMI > 23 kg/m^2, and systolic blood pressure ≥ 140 mmHg while normal HDL level is a protective factor.

Conclusion: The study illustrated that diabetic nephopathy was one of the significant health issues among patients with T2D at community hospitals. The modifiable risk factors including blood pressure level and BMI should be attenuated to inhibit the complications.

Keywords: diabetic nephropathy, prevalence, risk factors

Quality of Life among Chronic Kidney Disease Patients Receiving Continuous Ambulatory Peritoneal Dialysis in Wiang Chai District, Chiang Rai Province

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Background: Chronic kidney disease is a common chronic non-communicable disease. Most patients require ongoing treatment and have a high cost of treatment. Patients in the end stage of chronic kidney disease require kidney replacement therapy. Continuous peritoneal dialysis is an alternative treatment to perform dialysis at home. During the treatment, patients may experience complications from peritoneal dialysis that may affect the quality of life including physical, mental, environmental and social relationship aspect. Furthermore, patients may develop depression.

Objectives: To determine the quality of life and prevalence of depression among chronic kidney disease patients receiving continuous ambulatory peritoneal dialysis in Wiang Chai district, Chiang Rai Province

Methods: The study was conducted in a population of chronic kidney disease patients receiving continuous peritoneal dialysis at Somdet Prayannasungworn Hospital, Wiang Chai District who receive treatment before March 2019 and able to communicate and answer questions by themselves. In total, the samples were 33 people. The research instruments consisted of personal general history form, 2Q depression screening questionnaire, 9Q depression evaluation questionnaire, 8Q suicide assessment questionnaire, 26-item WHOQOL-BREF-THAI, and Thai Geriatric Depression Scale (TGDS-15). Descriptive statistics was used to analyse population characteristics. Statistics used for data analysis included frequency, percentage, range, mean, and standard deviation.

Results: Most of the participants had the overall mean scores of quality of life at good level. The participants had mean scores of each four aspects at good levels, which the highest number of patients at good level was environmental aspect and the least was social relationship aspect. Besides, most of the participants had no risk depression or very low risk of depression 90.9 percent, mild risk of depression 6.1 percent, and high risk of depression 3 percent. From 8Q, participants had mild risk of current suicidal ideation 3 percent and high risk of current suicidal ideation 3 percent.

Conclusion: This research suggested that health care providers should encourage family participation for proper and continuous care of the patients. The health care providers should have a plan to management and prevent depression. Moreover, giving the proper self-care and health education in chronic kidney disease patients receiving continuous ambulatory peritoneal dialysis is essential aspect.

Keywords: quality of life, end stage renal disease (ESRD), continuous ambulatory peritoneal dialysis (CAPD), depression

The Adequacy of Thrombectomy Centers in Thailand: a Geospatial Analysis

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Background: The standard treatment for patients with acute ischemic stroke in Thailand is intravenous thrombolysis, although thrombectomy can be done in some hospitals and it has shown better benefits in patients with large vessel occlusion

Objectives: This study aimed to enunciate the dispersion of thrombectomy-capable public facilities in Thailand and to optimize the planning of the locations of new thrombectomy centers for large-vessel ischemic stroke patients by geospatial analyses.

Methods: The locations of these facilities in Thailand were mapped in the geographic information system technology for geospatial analyses, using drive-time polygon towards the facilities in the allotted times. The amounts of time used were 3.5, 4.5, 5 and 6 hours, representing the window periods for thrombolysis administration (4.5 hours), endovascular thrombectomy (6 hours), and one hour before these times to mimic the real-world time loss during work-ups at the hospitals.

Results: Thirteen public facilities in Thailand currently perform thrombectomy in patients with large-vessel ischemic stroke. Nine of them are located in Bangkok province. The additional two equipped centers are planned to be operated in the near future by now-training interventionalists. The drive-time polygons showed vast areas not covered by the fifteen facilities. During after hours, only one facility in the South and four facilities in Bangkok are available for endovascular thrombectomy.

Conclusion: The North shows smaller drive-time polygons than other areas due to twisty roads in the mountains. Air ambulance would be more suitable, but it has limited access and can only be used in a clear-sky day. The vast plane of the Northeast shows a larger polygon which suits ground ambulance. However, one center cannot cover the majority of the area. The long-and-narrow Malayu Peninsula in the South also has the same problem. The condensation of thrombectomy centers in Bangkok reduces the number of patients in each center, imposing difficulty to set up 24-hour services. To conclude, thrombectomy-capable public facilities in Thailand are located throughout the country, but not yet cover most areas due to geographical challenges. The locations of new centers should be planned, using geospatial analyses and other information.

Keywords: Stroke, Thrombectomy centers, Transportation, Geospatial analysis, Thailand

Prevalence and Associated Factors of Cardiovascular Diseases among Patients with Chronic Kidney Disease in Bangkla Hospital, Chachoengsao, Thailand

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Background: Cardiovascular diseases are the major cause of death among patients with chronic kidney disease (CKD). In Thailand, there was limited information of the cardiovascular disease including ischemic heart disease, and cerebrovascular disease among patients with CKD especially in community hospital setting.

Objectives: To determine the prevalence and associated factors of cardiovascular diseases among CKD patients who visiting in Bangkla Hospital, Chachoengsao, Thailand

Methods: Total 1,079 CKD cases from Bangkla Hospital data was included for analysis. The data was collected from the database in Bangkla Hospital, Chachoengsao Province during July 1st, 2015 – July 1st, 2020. Using ICD10 diagnosis to identify and collect the CKD cases and cardiovascular diseases in patients with CKD. The demographic data was analyzed by descriptive statistic. Multivariate logistic regression analysis was used to evaluate the associated factors of cardiovascular diseases in patients with CKD. The study was reviewed and approved by the Institutional review board, RTA medical department.

Results: The prevalence of cardiovascular diseases (CVD) were 11.7%, which consists of ischemic heart disease, cerebrovascular disease and congestive heart failure at 4.7%, 5.7% and 1.6%, respectively. After adjusted for confounding factors, the associated factors of cardiovascular diseases which were gender and education level. Male gender tends to be increased risk of CVD in adjusted odds ratio (AORs) 2.13 (95%CI, 1.24-3.66). Higher education level associated with lower CVD in AORs 0.240 (95%CI, 0.09-0.59) in level of primary school, 0.17 (95%CI, 0.05-0.54) in junior high school and high school and at 0.09 (95%CI, 0.02-0.56) in the level of Bachelor's degree or higher; when use level below primary school as reference.

Conclusion: In this study the prevalence of CVD in CKD patients was 11.7%, and factors significantly associated with cardiovascular diseases were gender and lower education level.

Keywords: chronic kidney disease, cardiovascular disease, ischemic heart disease, cerebrovascular disease, community hospital

Prevalence and Associated Factors of Uncontrolled Hyperlipidemia among Thai Diabetic Patients with Clinical Atherosclerotic Cardiovascular Diseases (ASCVD); a Nation-wide Cross-sectional Survey, 2018

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Background: Dyslipidemia is one of the major risk factors of Clinical Atherosclerotic Cardiovascular Diseases (Clinical ASCVD) which is a group of diseases within a major mortality incidence in the world. In Thailand, a related study reported the prevalence of dyslipidemia among patients with diabetes mellitus (DM). However, limited information is available regarding the prevalence of uncontrolled dyslipidemia among patients with DM and ASCVD. We aimed to determine the prevalence and associated factors of uncontrolled hyperlipidemia among Thai patients with and Clinical ASCVD.

Objectives: to evaluate prevalence and associated factors of uncontrolled hyperlipidemia among Thai diabetic patients with clinical atherosclerotic cardiovascular diseases (ASCVD).

Methods: A cross-sectional study to assess outcomes among patients with DM who visited 987 public hospitals in Thailand was conducted in 2018 to evaluate status of care among diabetic patients with Clinical ASCVD aged at least 18 years receiving medical treatment in the target hospital for the last 12 months. Uncontrolled hyperlipidemia was defined by LDL level more than 70 mg/dL.

Results: A total of 1,527 Thai diabetic patients with history of ASCVD were included in the study. Uncontrolled hyperlipidemia was detected among 1,216 patients (79.6%; 95%CI 77.6-81.7). Multivariate analysis was conducted to determine which factors were most associated with uncontrolled hyperlipidemia and the results showed females (Adjusted odds ratio (AORs); 1.53, 95%CI; 1.17-1.99), using thiazolidinedione (AORs; 1.71, 95%CI; 1.07-2.72), community hospital (AORs; 4.27, 95%CI; 1.101-18.04) and higher BMI levels were the highest associated factors for uncontrolled hyperlipidemia in this population.

Conclusion: The study showed that uncontrollable hyperlipidemia was really a serious issue. Lipid profiles should be regularly monitored among patients with DM especially those presenting a history of Clinical ASCVD. Moreover, the health literacy of our patients should be improved to increase awareness of their behaviors especially body weight control. Eventually, healthcare services access by patients with DM especially in community settings should be adjusted and improved to alleviate cardiovascular complications.

Keywords: Uncontrolled hyperlipidemia, ASCVD, diabetes, prevalence, risk factors

Factor Associated with Pre-hospital Delay among Acute Stroke in Thaluang Hospital, Lopburi Province, Thailand

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Background: According to The World Health Organization, stroke is the second leading cause of death and the third leading cause of disability worldwide. The shorten pre-hospital time will contribute to good prognosis of stroke.

Objectives: To determine the factors associated with Pre-hospital delay among acute stroke in Thalaung Hospital, Lopburi Province, Thailand.

Methods: A cross-sectional study was performed, using data obtained from the database of Thaluang Hospital, Thaluang District, Lopburi Province. Data of 155 cases of acute stroke visiting Thaluang Hospital during January, 2013 to August, 2019 are collected from electronic medical records in Thaluang Hospital database.

Results: Patient with acute stroke visited Thaluang Hospital during the period from 1st January 2013 to 30 August 2019 is 155 case, 83 case are men, 72 is women. Average age is 66.5 year. Medical cost is covered by Universal Coverage Scheme 95.45%. Hypertension is 81.29%. Average pre-hospital time is 23.6 hour. Reaction after stroke, 43.87% of patients will directly visit hospital, 23.23% of patients will dial to emergency number, 20.65% of patients will observe the symptoms. 29.68% of patients recognized the symptoms. Average distance from scene to hospital is 11.73 kilometer. Protective factors associated with Pre-hospital delay more than > 4.5 hour is emergency call (1669), directly visits hospital, ask caregiver or family and cannot call for help, 0.02, 0.04, 0.004 and 0.02 times compared with observing clinical by themselves. Recognition problem as stroke 0.07 times compare with not recognize. Motor power weakness grade (0 to 1) 0.01 times compare to motor weakness grade 2 to 5.

Conclusion: In this study, most of patient cannot recognize symptoms as stroke. In order to increase perception of stroke signs as an emergency situation, campaign which is easy to understand for every population is important. From analyses, patients who recognize a problem, react to the problem as emergency and patients who have severe symptoms tend to come to hospital early. Hence, we should give information that mild symptoms such as mild weakness, facial palsy, dysarthria and dizziness can be signs of stroke and need to visit hospital immediately.

Keywords: stroke, pre-hospital delay, associated factors

Incidence and Risk Factors of Ischemic Heart Disease (IHD) among Hypertensive Patients in Sanam Chai Khet Hospital, Chachoengsao, Thailand: a 6-year Retrospective Cohort Study

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Background: At present, non-communicated diseases are a major public health problem in Thailand and worldwide. In Thailand, 24.7% of Thai people have Hypertension which mostly found for 64.9% in people age >80 years old. Hypertension is also associated with ischemic heart disease, cerebrovascular disease, and chronic kidney disease.

Objectives: We determined the incidence and risk factors of ischemic heart disease among hypertensive patients in Sanam Chai Khet Hospital, Chacheongsao, Thailand.

Methods: A 6-year retrospective cohort study was performed in Adults with hypertension who visited in Sanam Chai Khet Hospital between 2015-2020. The secondary data were retrieved from the electronic medical records of Sanam Chai Khet Hospital. Ischemic heart disease (IHD) was defined by ICD-10 including I200-I229 and I250 - I259. Descriptive statistics used to analysis demographic data and incidence. Cox proportional hazard regression analysis was performed to determine the hazard ratio for IHD.

Results: A total of 7389 patients with hypertension were enrolled in the study. The 6-years incidence rate of IHD among hypertensive patients was 0.567/100 person-year and cumulative incidence was 2.29%. After adjusting for the potential confounders, the risk factors of IHD were higher age (HR = 1.04; 95%CI, 1.02-1.05), male VS Female (HR = 1.39; 95%CI, 1.02-1.89), diabetes mellitus (HR = 2.18; 95%CI, 1.58-3.00), dyslipidemia (HR = 1.51; 95%CI, 1.04-2.17) and hypertensive crisis (HR = 1.74; 95%CI, 1.15-2.62).

Conclusion: Our data emphasized that IHD was one of the significant health problems among hypertensive patients. The modifiable risk factors for diabetes mellitus, hypertension and dyslipidemia should be alleviated to inhibit the progression of cardiovascular diseases and their complication.

Keywords: Ischemic Heart Disease, Hypertensive crisis, Diabetes mellitus, Dyslipidemia, Community hospital

Knowledge, Attitudes and Beliefs Related to Preeclampsia among Pregnant Women in Bangkok, Thailand: a Cross-sectional Study

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Background: Preeclampsia is the most common complication in pregnancy, the majority of deaths related to pre-eclampsia could be avoided with effective care. However, limited information is available about knowledge and attitude toward pre-eclampsia among pregnant women in Bangkok, Thailand.

Objectives: This study aimed to explore knowledge, attitudes and beliefs on preeclampsia among pregnant women during their pregnancy period in Phramongkutklao Hospital, Bangkok, Thailand.

Methods: A cross-sectional survey was conducted on pregnant women at the antenatal clinic over a period of 2 weeks. The questionnaire collected demographic and other data; it included 19 questions on their general knowledge and attitude toward preeclampsia including their awareness of the disease during pregnancy. The data was analyzed quantitatively. This research protocol was approved by the ethics committee of Institutional Review Board of the Royal Thai Army Medical Department and all participants had been given informed consent to participate in the research study.

Results: In total, 100 pregnant women participated and provided information through a self-administered questionnaire. From the analyzed data, it was found that 1.05% of the interviewed women, did not know anything about the subject. The rest was evaluated as they had some knowledge about the topic. From those, 48.42% have little knowledge on the topic, and 50.53% gave the almost entirely correct definition. Moreover, 65.35 % have positive attitude, while the rest tend to have negative attitude towards risk of preeclampsia.

Conclusion: Despite of the impact that preeclampsia represents on mother and baby's health, our results show that information in the studied group, is relatively high. The studied group has more access to information, showing us that access to information is a key to educate patient. Thought people have high knowledge of the disease, but the risks are overlooked. Thus, we believe that it is necessary to apply instruments that could redefine, in a greater way, the real information level to the female population in all levels of assistance. In an era that social nets had changed human behavior, why should not we use it as an efficient tool to promote life quality?

Keywords: preeclampsia, knowledge, attitude, beliefs

Preoperative Determination of Tibial Nail Length Using a Patient's Height with a Formula

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Background: Intramedullary interlocking nails (IM) is a broadly used method for tibial shaft fracture fixation. It is important to apply appropriate nail length to fix those fractures. There are many ways to estimate nail length preoperatively. Using a patients' height is an easy and applicable technique in clinical practices. The purpose of this study is to estimate tibial nail length from a patients' height. This study has found out that determining the tibial nail length from a patients' height with a formula would be a simple, convenient and reliable method for surgeon to select the correct length of a tibial nail.

Objectives: To assess the correlation between tibial nail length and a patient's height.

Methods: A cohort of 118 consecutive patients with 119 tibial shaft fractures were retrospectively identified at our institution between 2008 and 2019, via ICD 10 database. Post operative radiographs were reviewed. After excluding radiographic findings with inappropriate nail length, 68 cases were included for analysis. The true lengths of the nails and patients' heights were reviewed from medical records. The regression equation was then applied to find the correlation between the lengths of the nails and patients' height.

Results: There was a significant correlation between patients' height and appropriate tibial nail length with a Pearson correlation coefficient of 0.62, which represent a moderate positive relationship with predictive value of 0.38 ($p < 0.01$). There were some outlier cases from the study. After excluding the outliers, the Pearson correlation coefficient rose to 0.75 and then predictive value increased to 0.57. After linear regression was analyzed, we found that there was a predictive equation as follows: Nail length = (1.85 x Height (cm)) + 11.

Conclusion: Preoperative assessment of tibial nail length with a patient's height is a simple, convenient and reliable method. We found a formula to estimate a tibial nail length = (1.85 x Height (cm)) + 11 with fairly strong positive relationships and predictive value.

Keywords: Tibial nail length, Plafond fracture, Orthopedics surgery, Trauma

Prevalence and Risk Factors of Chronic Kidney Disease among Patients Visiting in NCD Clinic, Sanam Chai Khet Hospital, Chachoengsao Province, Thailand

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Background: In the present, chronic kidney disease is one of the major problems in Thailand and worldwide. According to the research, the prevalence of chronic kidney disease in 2017 is 697.5 million people across the globe or around 9.1 percent of the world population, the prevalence is increased by 29.3 percent from 1990 to 2017. However, in Thailand, the CKD information among NCDs clinics is limited especially in a community hospital. Thus, we would like to investigate the prevalence and risk factors of CKD in Sanam Chai Khet Hospital, especially the body mass index (BMI) of patients.

Objectives: To determine the prevalence and factor associated with CKD among non-communicable diseases (NCDs) patients in Sanam Chai Khet Hospital, Checheongsao, Thailand.

Methods: A cross-sectional study was conducted to investigate the prevalence and risk factors of chronic kidney disease among patients visiting in NCDs clinic of Sanam Chai Khet Hospital during 2016-2020. The data were retrieved from electronic medical records of the hospital information system. Descriptive statistics were used to analysis demographic data and prevalence. Multivariate logistic regression analysis was performed to determine the factors associated with CKD.

Results: A total of 1,263 patients in the NCDs clinic participated in the study. There were 937 patients diagnosed with chronic kidney stage 3 or above, the prevalence of CKD stage 3 or above among patients in NCDs clinic was 74.19 %. After adjusted for confounding factors, the risk factors of CKD stage 3 or above were patients who were over 70 years old (Adjusted odds ratio (AOR) = 3.59; 95%CI, 2.47-5.21), BMI greater than 23 kg/m^2 (AOR = 0.74; 95%CI, 0.49-1.12), diabetes patients (AOR = 2.39; 95%CI, 1.76-3.26), and hypertensive crisis (AOR = 8.83; 95%CI, 2.09-37.37).

Conclusion: The study illustrated that CKD was one of the significant health issues among patients in NCDs clinics at community hospitals. The modifiable risk factors including blood pressure level, diabetes should be attenuated to inhibit the complications.

Keywords: advanced chronic kidney disease, prevalence, risk factors

AUTHOR INDEX

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