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The 2016 US-Thai Pharmacy Education Consortium

June 1-3, 2016

Khon Kaen, Thailand

Research Article and Abstract

Poster Presentation

IJPS Isan Journal of Pharmaceutical Sciences

IJPS Online http:// www.tci-thaijo.org/index.php/IJPS

Aims and Scopes

- To publish research and initiative work on broad aspects of pharmaceutical sciences and health sciences.
  The breadth of its coverage are pharmacy practice, pharmaceutical care, pharmaceutical technology, pharmaceutical/medicinal chemistry, pharmacology, pharmacokinetics, pharmaceutical botany, pharmacognosy and natural products, social and administrative pharmacy, pharmacoeconomics, nutraceutical, cosmetic sciences and beauty, biotechnology and pharmacogenomics.
- To provide a forum for communicating data and comments on relevant research among academics and researchers.

Publication types

Original research article, review article

Publishing period

Four yearly (March, June, September and December)

Owner/Editorial periods

Faculty of Pharmaceutical Sciences, Khon Kaen University (KKU)
123 Mittraphap Road, Khon Kaen, 40002 Thailand.

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Agenda for the 2016 US-Thai Pharmacy School Consortium
Pre-conference: May 30-31, 2016 (Bangkok)
Conference: June 1 – 3, 2016 (Khon Kaen)

Pre-conference Workshop (May 30-31, 2016): No registration fee for US participants

(Part of 2016 Thailand National Pharmacy Education Conference)

City Location: Bangkok

May 30, 2016 Updates and Trends in Pharmacy Education

Venue: **Meeting Hall, 10th Floor of the Pharmacy Innovative Building**
Faculty of Pharmaceutical Sciences, Chulalongkorn University, Bangkok
254 Phyathai Road, Pathumwan, Bangkok 10330

Hosted by: **Faculty of Pharmaceutical Sciences, Chulalongkorn University**

Hotels: **Option 1: Pathumwan Princess (Across the street from the venue)**
444 MBK Center, Phayathai Road, Pathumwan, Bangkok 10330
http://www.pprincess.com/
Tel: 0-2216-3700
Room rate: Single-bed room 3,100 baht, Twin-bed room 3,300 baht
Novotel Bangkok on Siam Square (650 meter away from the venue)
392/44 Siam Square Soi 6, Bangkok 10330
http://www.novotelbkk.com/
Tel: 0-2209-8888
Room rate: Single-bed room 3,414 baht, Twin-bed room 3,767 baht

May 30, 2016		
Time	**Topic**	**Speakers**
08.45 – 09.00	**Opening Ceremony**	
09.00 – 09.30	**Current Situation and Trends in Management of Pharmacy Education in Thailand (Thai)**	**Rungpetch Sakulbumrungsil, PhD** President, Pharmacy Education Consortium of Thailand & Dean, Faculty of Pharmaceutical Sciences, Chulalongkorn University
09.30 – 10.15	**Keynote1: Transformative Education for Pharmacy Students (English)**	**Michael Katz, PharmD** Director of International Programs (University of Arizona) **Melody Ryan, PharmD, MPH, CGP, BCPS** Director, International Professional Student Education (University of Kentucky)
10.15 – 10.45	Coffee break	
10.45 – 11.30	**Keynote 2: Establishment and Implementation of Inter-professional Education: US Experience (English)**	**Carolyn Ma, PharmD, BCOP, CHTP** Interim Dean, Associate Professor & Chair of Pharmacy Practice Department (University of Hawaii at Hilo)
11.30 – 12.30	**Inspiration & Update: Patient Safety Curriculum (Thai)**	**Nattasiri Thanawuth, PhD** Clinical Pharmacy Department, Prince of Songkla University **Piyawan Limprasert, MD** Deputy Director, Healthcare Accreditation Institute (Public Organization) **Pisonthi Chongtrakul, MD** Department of Pharmacology, Faculty of Medicine, Chulalongkorn University **Nattasiri Thanawuth, PhD** Clinical Pharmacy Department, Faculty of Pharmaceutical Sciences, (Prince of Songkla University)

May 30, 2016		
12.30 – 13.30	**Lunch / poster presentation**	
13.30 – 16.00	**Transformative Learning in Pharmacy Education: Case Study & Discussion (Thai)**	
	Room 1: Transformed Outcome: Mindset in Patient Safety & IPE (Thai) - Patient Safety & RDU Curriculum in Pharmacy Education: Why and how to? - Patient Safety course design: A success story from Mahidol University - Teaching experiences in "Patient Safety & RDU": Not that's difficult - Inter-Professional Education (IPE): Humanized care at home	**Nattasiri Thanawuth, PhD** Clinical Pharmacy Department, Faculty of Pharmaceutical Sciences, Prince of Songkla University **Pramote Tragulpiankit, PhD** Department of Pharmacy, Faculty of Pharmacy, Mahidol University **Juraporn Pongwecharak, PhD** Pharmaceutical Care Department, Faculty of Pharmacy, Thammasat University **Hathaikan Chowwanapoonpohn, PhD** Pharmaceutical Care Department, Faculty of Pharmacy, Chiangmai University **Chanuttha Ploylearmsang, PhD** Social Pharmacy group, Faculty of Pharmacy, Mahasarakham University **Moderator:** **Arom Jedsadayanmeta , PharmD, PhD, BCPS** Pharmaceutical Care Department, Faculty of Pharmacy, Thammasart University
	Room 2: Transformed Outcome: Mindset in Humanized Health Professionals (Transformative education) (Thai) - 6 Steps of Skills for Student in Working with Community (Walailak University) - Community-based learning: Opportunity for engaging students with the core value of pharmacists (Chiangmai University) - Com-Med: Experience from Khon Kaen University - "Pan Gown Hai Kow Jai Din": Community learning (Mahasarakham University)	**Siranee Yongpraderm** School of Pharmacy, Walailak University **Puckwipa Suwannaprom, PhD** Pharmaceutical Care Department, Faculty of Pharmacy, Chiangmai University **Siritree Suttajit, PhD** Pharmaceutical Care Department, Faculty of Pharmacy, Chiangmai University **Kornkaew Chantapasa, PhD** Social and Administrative Pharmacy Division, Faculty of Pharmaceutical Sciences, Khon Kaen University **Kritsanee Saramunee, PhD** Social Pharmacy Group, Faculty of Pharmacy, Mahasarakham University **Moderator:** **Korn Sornlertlamvanich, PhD** Faculty of Pharmaceutical Sciences, Prince of Songkla University

Dinner: **Hosted by PECT & Khon Kaen University**

18.00 PM

Drink: **Vertigo Moon Bar**

20.00 PM http://www.banyantree.com/en/ap-thailand-bangkok/vertigo-and-moon-bar
21/100 South Sathon Road, Sathon, Bangkok 10120, Thailand Tel: +66 (0) 2679 1200

May 31, 2016: From Competency to Pedagogy and Assessment

Venue: **Faculty of Pharmaceutical Sciences, Chulalongkorn University, Bangkok**
254 Phyathai Road, Pathumwan, Bangkok 10330

Hosted by: **Faculty of Pharmaceutical Sciences, Chulalongkorn University**

Hotels: **Pathumwan Princess**
444 MBK Center, Phayathai Road, Pathumwan, Bangkok 10330
http://www.pprincess.com/
Novotel Bangkok on Siam Square
392/44 Siam Square Soi 6, Bangkok 10330
http://www.novotelbkk.com/

May 31, 2016		
Time	**Topic**	**Speakers**
09.00 – 10.00	**Keynote 3: Use of Simulations for Authentic Learning & Assessment**	**Debra Barnette, PharmD, BCPS, BCACP, CDE, FCCP,** Assistant Professor**,** Ohio State University **Paul Jungnickel, PhD** Associate Dean and Professor, Auburn University Harrison School of Pharmacy
10.00 – 11.15	**Designing A Competency-based Curriculum & Assessment**	**Danai Wangsaturaka, MD, PhD** Associate Dean for Academic Affairs Faculty of Medicine, Chulalongkorn University
11.15 – 11.45	Coffee break	
11.45 – 12.15	**How Do We Teach in the Faculty of Pharmaceutical Sciences: Strengths and Challenges in Development (Review + Gap Analysis)**	**Siriporn Burapadaja, PhD** Associate Dean for Academic Affairs Facuty of Pharmacy, Chiangmai University **Anuchai Theeraroungchaisri, PhD** Associate Dean for Educational Innovation Affairs, Faculty of Pharmaceutical Sciences Chulalongkorn University
12.15 – 13.15	**Lunch / poster presentation**	
13.15 – 15.30	**Workshops:** **Room 1: From Outcome to Instruction: Designing Blended Learning**	**Dr. Susan D'Aloia** Client Success Advocate, APAC, Blackboard Inc
	Room 2: Using Portfolios for Student Improvement and Assessment	**Danai Wangsaturaka, MD, PhD** Associate Dean for Academic Affairs Faculty of Medicine, Chulalongkorn University
15.30 – 16.00	**Conclusion & the Way Forward**	

Pre-conference ASEAN Pharmacy Education (Invited representatives from Cambodia, Indonesia, Laos, Malaysia, Philipines, Singapore, Thailand)

City Location: Khon Kaen

June 1, 2016

Venue: **Main Theater Auditorium**
Faculty of Pharmaceutical Science, Khon Kaen University, Khon Kaen
No.123, Naimaung, Muang, Khon Kaen, Thailand 40002
Telephone: +(66) 43 202378, +(66) 43 202 378
http://pharm.kku.ac.th

Hosted by: **Faculty of Pharmaceutical Science, Mahasarakam University**
Faculty of Pharmaceutical Science, Khon Kaen University

Hotel: **Pullman Raja Orchid Hotel, Khon Kaen**
http://www.pullmanhotels.com/gb/hotel-1877-pullman-khon-kaen-raja-orchid/index.shtml
9-9 Prachasumran Road, Nai Muang, Muang, 40000 Khon Kaen
Telephone: (+66)43/322155 Fax: (+66)43/322150
Email: pullman@pullmankhonkaen.com
GPS: N 16° 25' 47.27" E 102° 49' 49.36"

Thai Pharmacy Education incorporation into ASEAN Pharmacy

Tentative schedule

May 30, 2016		
Date and Time	**Activities**	**Coordinators**
May 30, 2016	Visitors from 7 countries arrive Khon Kaen Airport and check in a hotel	

May 31, 2016		
May 31, 2016	**At the Faculty of Pharmacy, KKU**	
08.30	**Arrive at KKU**	MSU van
08.30-09.00	**Registration**	MSU staff
09.00	**Break will be served during the meeting**	MSU staff
09.00-09.30	**Opening ceremony** By Dean **Juntip Karnjanasilp** Introduction to the Faculty of Pharmacy, MSU	**Moderator:** **Mr. Pemmarin Potisarach**, MSU/Maryland University
09:30-11:30	**Presentations: CURRENT and FUTURE status of pharmacy education and practice in ASEAN** **(20 minutes each)** **Moderators:** 1) Thailand: Dr. Suphat Subongkot /KKU 2) Malaysia 3) Philippines 4) Lao P.D.R.	**Moderator:** **Dr. Theerapong Seesin, Pharm.D.** **Dr. Michael D. Katz** **Note taker:** **Dr. Pawitra Pulbutr** **Dr. Benjamart Cushnie**
11.30-13.00	**Lunch and networking at the meeting room**	
13.00-15.30	**Presentations: What is the CURRENT and FUTURE direction for pharmacy education and practice in ASEAN** **(20 minutes each)** 1) Singapore 2) Indonesia 3) Cambodia 4) Vietnam	**Moderator:** **Dr. Phayom Sookaneknun** **Dr. Gary Smith** **Note takers:** **Ms Krongkwan Duangpawang** **Mr. Pemmarin Potisarach**

May 31, 2016		
Date and Time	**Activities**	**Coordinators**
15.30-16.00	Conclusion and closure	**Dr. Michael Katz**
17.00-18.30	Dinner	Ms. Panissa Senawong (MSU)

June 1, 2016		
Date and Time	**Activities**	**Coordinators**
Jun 1, 2016	**At the Faculty of Pharmacy, KKU**	
08.30-9.00	**Registration**	MSU staff
09.00-9.30	**Welcome address** IMPACT OF US-THAI CONSORTIUM ON PRACTICE AND EDUCATION IN THAILAND	**Moderators:** **Dr. Somkid Janeklang** **Dr. Melody Ryan**
09.30-10.00	Core competencies for Pharmacy Education: ASEAN Perspective	**Dr. Surakit Nathisuwan**
10.00-10.10	Break	
10.10-12.00	**Introductory remark**: **Dr. Michael Katz**—goals and collaborative models Panel discussion: Collaboration of ASEAN countries to advance pharmacy education and practice Desired Outcomes: Definition of common goals Organizational structure Include all ASEAN countries Written agreement Next Meeting: ACCP in Seoul?	**Dr. Michael Katz** **Dr. Suphat Subongkot** **Note taker:** **Dr. Pattarin Kittiboonyakun** and team
12.00-13.00	**Lunch**	

Name list of invited representatives from ASEAN countries

Country	Name	Affiliation
1. Malaysia	**Prof. P.T. Thomas**	Taylor's University
2. Cambodia	**Prof Tea Sok Eng**, Dean, Faculty of Pharmacy, University of Health Sciences	+855 23 430 129
3. Vietnam	**Prof Hung (Hung Nguyen Van)**--Dean--from Haiphong University	hungnguyenv@gmail.com
4. Laos	**Dr.Chanthanom Manithip** Assoc.Dean for Administration, University of Health Sciences	manithipchanthanom@gmail.com
5. Philippines	**Prof Yolanda Robles**	Yolanda_robles84@yahoo.com
6. Indonesia	**Dr.Daryono Hadi Tjahjono**	daryonohadi@fa.itb.ac.id, daryonohadi@yahoo.com
7. Singapore	**Dr.Wai Keung Chui**, National University of Singapore	wkchui@nus.edu.sg
	Lita Chew, Adjunctive Assistant Professor National University of Singapore National Cancer Center	lita.chew@nccs.com.sg, phmcst@nccs.com.sg

Agenda for the 2016 US-Thai Pharmacy School Consortium
June 1 – 3, 2016

City Location: Khon Kaen

June 1-3, 2016

Venue: **Main Theater Auditorium**
Faculty of Pharmaceutical Science, Khon Kaen University, Khon Kaen
No.123, Naimaung, Muang, Khon Kaen, Thailand 40002
Telephone: +(66) 43 202378, +(66) 43 202 378
http://pharm.kku.ac.th

Hosted by: **Faculty of Pharmaceutical Science, Khon Kaen University**
Faculty of Pharmacy, Mahasarakam University
Faculty of Pharmaceutical Science, Ubon Ratchathani University

Hotel: **Pullman Raja Orchid Hotel, Khon Kaen**
http://www.pullmanhotels.com/gb/hotel-1877-pullman-khon-kaen-raja-orchid/index.shtml
9-9 Prachasumran Road, Nai Muang, Muang, 40000 Khon Kaen
Telephone: (+66)43/322155 Fax: (+66)43/322150
Email: pullman@pullmankhonkaen.com
GPS: N 16° 25' 47.27" E 102° 49' 49.36"

June 1, 2016		
Time	**Topic**	**Speakers**
14.00 – 16.00	**Registration**	
16.00 – 17.00	**Work group meeting** Education (Room: Chattan 1) Research (Room: Chattan 2) Residency (Room: Erawan 1) Exchange (Room: Erawan 2) Workforce development (Room: Iyara)	
17.00 – 18.00	**Steering Committee Meeting** **Location:** Famui	
18.00 – 20.00	**Welcome Reception** **Location:** Saigon Vietnamese Restaurant	

June 2, 2016		
Time	**Topic**	**Speakers**
08.00 – 09.00	**Registration**	
	Plenary Session	
09.00 – 09.45	**General Assembly & Opening Ceremony** **Location:** Orchid Ballroom 1	**Moderator:** **Suphat Subongkot, Pharm.D, BCPS, BCOP,** Assistant Professor, Khon Kaen University
	Welcome address	**Kittichai Triratanasirichai, PhD** President, Khon Kaen University **Paiboon Daosodsai, PhD** Dean, Faculty of Pharmaceutical Sciences, Khon Kaen University
	Greeting from PECT	**Rungpetch Sakulbumrungsil, PhD** President, Pharmacy Education Consortium of Thailand & Dean, Faculty of Pharmaceutical Sciences, Chulalongkorn University
	Greeting from Organizing Committee	**Sumon Sakolchai, PhD** Chairman, Advisory Board of the Organizing Committee
	Greeting from Consortium Steering Committee	**Michael Katz, PharmD** Professor and Director of International Programs, University of Arizona

June 2, 2016		
Time	**Topic**	**Speakers**
Plenary Session		
09.45 – 10.15	**Group photo & morning break** **Location:** Pullman Khon Kaen Raja Orchid Main Lobby	
10.15 – 11.15	**Plenary Session 1: Consortium Activities Update** **Location:** Orchid Ballroom 1	**Moderator:** **Sirada Jones, PharmD, MS, BCPS, BCCCP,** Office of Global Health University of Wisconsin
	2014 – 2016 Consortium Activity Report (10 mins)	**Michael Katz, PharmD** Professor and Director of International Programs University of Arizona
	Current Status of Residency / Fellowship Training of Thailand (20 mins)	**Suthiporn Pattarachaiyakul, PharmD, BCP** President, College of Pharmacotherapy of Thailand & Prince of Songkla University
	Research Landscape of Thai Pharmacy Schools: Bibliometric Analysis (20 mins)	**Surakit Nathisuwan, PharmD, BCPS** Deputy Dean for Planning & Quality Development, Mahidol University
	Q & A (10 mins)	
11.15 – 12.15	**Plenary Session 2: Workforce**	**Moderator:** **Thitima Doungngern, PharmD, BCPS** Deputy Dean for Academic Affairs, Prince of Songkla University
	Thai Pharmacy Workforce Projection (25 mins)	**Khunjira Udomaksorn, PhD** Prince of Songkla University
	Panel Discussion: Promotion criteria and career paths for clinical faculty members and faculty-preceptors (35 mins)	**Janet Engle, PharmD, PhD (Hon), FAPhA, FNAP** Professor and Department Head, Pharmacy Practice, University of Illinois at Chicago **Paul Jungnickel, PhD** Professor and Associate Dean, Auburn University Harrison School of Pharmacy **Bernard Sorofman, PhD** Professor and Executive Associate Dean, University of of Iowa
12.15 – 13.30	**Lunch: Salathai Room** **Poster presentation: Orchid Ballroom Foyer**	
13.30 – 15.00	**Plenary Session 3: Pharmacy Education** **Location:** Orchid Ballroom 1	**Moderator:** **Sawaeng Watcharathanakij, PhD** Ubon Ratchathani University
	Sharing Experience in Inter-professional Learning	**Randell Doty, PharmD** Associate Professor and Director of International Programs, University of Florida **Chanuttha Ploylearmsang, PhD** Associate Dean for Research and Quality Assurance, Mahasarakam University
	Open floor discussion	
15.00 – 15.30	**Coffee break**	

June 2, 2016		
Time	**Topic**	**Speakers**
Concurrent Session 1		
15.30 – 17.00	**Concurrent Session 1A: Research** **Location:** Orchid Ballroom 1 **Moderator:** **Chidchanok Ruengorn**, PhD (CMU)	**Concurrent Session 1B: Workforce Development** **Location:** Fahmui **Moderator:** **Gary Oderda, PharmD**, MPH, University of Utah **Sirada Jones, PharmD**, MS, BCPS, BCCCP University of Wisconsin
	Current and Future Trend of Pharmaceutics Research (25 min) **Aliasger K. Salem, PhD**, University of Iowa **Current and Future Trend of Drug Discovery Research (25 min)** **Pui Kai Li, PhD**, Ohio State University **Strategies and Mechanisms to Promote Research Collaboration (15 min)** **Pornsak Sriamornsak, PhD**, Silpakorn University	**Panel Discussion A: Relationships between college of pharmacy and Academic Medical Centers (including promotion criteria/incentive programs for preceptors/non-faculty members) (1 hour)** **Marilyn Speedie, PhD**, University of Minnesota **Donald Letendre, PharmD**, University of Iowa) **Alan Lau, PharmD, FCCP**, University of Illinois at Chicago **Preecha Montakantikul, PharmD**, BCP, Mahidol University **Rungtiwa Muenpa, PhD**, Lampang Provincial Hospital **Panel Discussion B: Post-doctoral / fellowship opportunities for Thai faculty/ Thai PharmD graduate (30mins)** **Outcome research fellowship program @ Utah** **Gary Oderda, PharmD, MPH**, Universityh of Utah **Tanatape Wanishayakorn**, Prince of Songkla University) **Surasak Saokaew, PhD**, Payao University **Fellowship programs for International Pharmacists at Wisconsin** **Sirada Jones, PhD**, University of Wisconsin **Suppachai Insuk, PharmD, BCPS**, Naresuan University **Itsarawan Sakunrag, PharmD, BACAP**, Naresuan University
17.15 – 18.30	**Business meeting: US & Thai Deans, official representatives & steering committee** **Location:** Eravan	**Moderators:** (Steering Committee Co-Chairs **Michael Katz**, University of Arizona **Surakit Nathisuwan**, Mahidol University
18.30 – 20.30	**Welcome Dinner** **Location:** Salathai Room **Dress Code:** National custom or casual	

June 3, 2016		
Time	**Topic**	**Speakers**
08.00-9.00	**Registration**	
Concurrent Session		
09.00 – 10.15	**Concurrent Session 2A: Residency** **Location:** Orchid Ballroom 1 Moderator: **Thitima Doungngern, PharmD, BCPS**, Prince of Songkla University	**Concurrent Session 2B: Exchange** **Location:** Fahmui **Moderator:** **Gary Oderda, PharmD, MPH**, University of Utah **Phayom Sookaneknun, PharmD, PhD**, Mahasarakham University
	Assessment of Clinical Skills & Competency **Michael Katz, PharmD**, University of Arizona **Douglas Slain, PharmD**, West Virginia University Representative of Residency Program of Thai Schools	**Best Practice in Student Exchange Programs** **Surakit Nathisuwan, PharmD, BCPS**, Mahidol University **Paul Jungnickel, PhD**, Auburn University Representatives from Naresuan, Prince of Songkla, Khon Kaen

June 3, 2016		
Time	**Topic**	**Speakers**
10.15 – 10.45	**Coffee break**	
Plenary Session		
10.45 – 12.00	**Workgroup Report & Discussion** **Location:** Orchid Ballroom 1	**Moderator:** **Michael Katz, PharmD**, University of Arizona) **Surakit Nathisuwan, PharmD, BCPS**, Mahidol University
12.00 – 13.30	**Lunch: Coffeshop Room** **Poster presentation: Orchid Ballroom Foyer**	
13.30 – 14.30	**Concluding Session (Future Direction)**	**Moderator:** **Michael Katz, PharmD**, University of Arizona) **Surakit Nathisuwan, PharmD, BCPS**, Mahidol University
14.30 – 15.00	**Closing Ceremony** **Paiboon Daosodsai, PhD** Dean, Faculty of Pharmaceutical Sciences, Khon Kaen University **Rungpetch Sakulbumrungsil, PhD** President, Pharmacy Education Consortium of Thailand & Dean, Faculty of Pharmaceutical Sciences, Chulalongkorn University	**Moderator:** **Suphat Subongkot, PharmD, BCPS, BCOP**, Khon Kaen University

Excursion Trips: June 4-7, 2016

Option 1: Northeast (Nongkhai & Vientiane, Laos PDR)
Hosted by Khon Kaen & Mahasarakarm Universities

Option 2: Northeast (Ubon Ratchathani, Jampasak, Konpapeng Waterfall, Liphi, Laos PDR)
Hosted by Ubon Ratchathani & Mahasarakarm Universities

Option 3: North (Chiangmai & Lampang)
Hosted by Chiangmai & Payup Universities

Option 4: South (Krabi, Trang, Hat Yai)
Hosted by Prince of Songkla University

Option 5: Central (Bangkok, Thonburi, Ayutthaya, Nakornpathom)
Hosted by Burapha (confirmed), Rangsit (confirmed)
Silpakorn & Siam (to be confirmed)

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Steering Committee

Paul Jungnickel	Auburn US
Michael Katz	Arizona US
Alan Lau	Illinois-Chicago US
Sirada Maphanta-Jones	Wisconsin US
Ed Moreton	Maryland US
Gary Oderda	Utah US
Melody Ryan	Kentucky US
Doug Slain	West Virginia US
Krittin Bunditanukul	Chulalongkorn Thailand
Thitima Doungngern	Prince of Songkla Thailand
Anjana Fuangchan	Naresuan Thailand
Arunrat Lucksiri	Chiang Mai Thailand
Surakit Nathisuan	Mahidol Thailand
Payom Soomaneknun	Masaharakam Thailand
Suphat Subonkot	Khon Kaen Thailand

Planning Committee

Paiboon Daosodsai	Khon Kaen Thailand
Sumon Sakolchai	Khon Kaen Thailand
Bungorn Sripanidkulchai	Khon Kaen Thailand
Aparanee Chaiyakum	Khon Kaen Thailand
Wongwiwat Tassaneeyakul	Khon Kaen Thailand
Suphat Subongkot	Khon Kaen Thailand
Acharawan Topark-Ngarm	Khon Kaen Thailand
Natthida Weerapreeyakul	Khon Kaen Thailand
Nusaraporn Kessomboon	Khon Kaen Thailand
Supon Limwattananon	Khon Kaen Thailand
Supatra Porasuphatana	Khon Kaen Thailand
Suthan Chantawong	Khon Kaen Thailand
Arthit Vongprajan	Khon Kaen Thailand
Taechit Cheunprathumthong	Khon Kaen Thailand
Duangkamon Sakloetsakun	Khon Kaen Thailand
Denpong Patanasethanont	Khon Kaen Thailand
Yaowared Chulikhit	Khon Kaen Thailand
Sirichanya Kaewsaraphum	Khon Kaen Thailand
Thapanee Seeharach	Khon Kaen Thailand
Maneerat Rattanamahattana	Khon Kaen Thailand
Theeradej Imauan	Khon Kaen Thailand
Boonkongsil Wanmontree	Khon Kaen Thailand
Anchalee Naknan	Khon Kaen Thailand
Vasana Patumtanasap	Khon Kaen Thailand
Pornwipa Suttanakho	Khon Kaen Thailand
Sinchai Ngernkundaung	Khon Kaen Thailand
Thongkum Vongprajan	Khon Kaen Thailand

Workgroup Education

Members	Institution	Charges
Alan Lau	UIC	Explore shared e-elearning opportunities between US and Thai Institutions
Melody Ryan	UK	
Suphat Subonkot	KKU	
Kornkaew Chantapasa	KKU	
Somchai Suriyakrai	KKU	
Aram Jedsadayanmeta	TU	
Earlene Lipowski	Florida	Determine extent of curriculum mappaing in Thailand; compare curricula between Thai schools; compare Thai cirricula to US accreditation standards
Sarinee Krittiyanun	RSU	
Nattiya Kapol	Silpakorn	Determine steps needed to develop a combined PharmD/PhD program in Thailand
Pornsak Sriamornsak	Silpakorn	
Jeanine Mount	Wisconsin	
Holly Mason	Purdue	
Wirat Niwatananun	CMU	
Uraiwan Akanit	UBU	
Charuwan Thanawiroon	UBU	
Korn Sornlertlamvanich	PSU	
Usanee Wanakamanee	PSU	
Pattarin Kittiboonyakun	MSU	
Juntip Kanjanasilp	MSU	
Weerachi Chaijamorn	Siam University	
Jainuch Kanchanapoo	Siam University	
Pithan Kositchaivat	Siam University	
Sirikanlaya Benjawan	Siam University	
Naeti Suksomboon	Mahidol	
Kraisorn Chairojkanjana	PYU	
Nijaporn Yanasarn	PYU	
Panthara Chulasai	PYU	
Jatuporn Suwannakit	PYU	
Anjana Fuangchan	NU	

Workgroup Workforce

Members	Institution	Charges
Gary Oderda	Utah	Determine waht skill development is needed for Thai pharmacists
Sirada Maphanta-Jones	Wisconsin	Explore methods of establishing a teaching certificate program
Arthur Lipman	Utah	Determine steps needed to establish research fellowships for Thai PharmD Faculty
Krittin Bunditanukul	Chula	Suggest model equitable promotion criteria for clinical and basic science faculty
Jeanine Mount	Wisconsin	
Connie Kraus	Wisconsin	

Members	Institution	Charges
Aroonrut Lucksiri	CMU	
Chutinun prasitpuriprecha	UBU	
Saksit Sripa	UBU	
Sirima Sitaruno	PSU	
Wanida Caichompoo	MSU	
Wanarat Anusornsangiam	MSU	
Jainuch Kanchanapoo	Siam University	
Suwapab Techamahamaneerat	Siam University	
Paveena Sonthisombat	NU	
Nusaraporn Kessomboon	KKU	

Workgroup Residency

Members	Institution	Charges
Michael Katz	Arizona	Create self-help program for residences
Doug Slain	WVU	
Thitima Doungngern	PSU	
Arunrat Lucksiri	CMU	
Jessica Starr	Auburn	Explore necessary steps to develop a residency accreditation process for Thailand
Supatat Chumnumwat	Mahidol	
Wandee Taesotikul	CMU	Establish models for residency funding
Don Letendre	Iowa	
Cindi Koh-Knox	Purdue	
Adam Bursua	Illinois	
Sarah Westburg	Minnesota	
Mantiwee Nimworapan	CMU	
Manit Saeteaw	UBU	
Theerapong Seesin	MSU	
Areerut Leelathanalerk	MSU	
Weerachi Chaijamorn	Siam University	
Apiphot Songen	Siam University	
Itsarawan Sakunrag	NU	
Sirikan Srisopa	NU	
Aporanee Chaiyakum	KKU	
Suthan Chanthawong	KKU	
Pawalee Niemthaworn	KKU	

Workgroup Exchanges

Members	Institution	Charges
Paul Jungnickel	Auburn	Develop a model for short-term visiting scholar programs in the US
Janet P. Engle	UIC	
Phayom sookaneknun	Mahasarakham	Develop a model for extended-time visiting faculty schlolars program in Thailand
Krittin Bunditanukul	Chula	Determine ways to facilitate Fulbright scholars (include Fulbright seniors program)
Hazel Seaba	Iowa	Explore ways to finance international experiences for students

Members	Institution	Charges
Pat Chase	West Virginia	
Salisa Westrick	Auburn	
Julie Johnson	Minnesota	
Chris Jolosky	Minnesota	
Penkarn Kanjanarat	CMU	
Peerawat Jinatongthai	UBU	
Sutthipporn Pattharachayakul	PSU	
Thananan Ratnachodpanich	MSU	
Phayom Sookaneknun	MSU	
Suchada Jongrungruangchok	RSU	
Nalinee Pradubyat	RSU	
Weerachi Chaijamorn	Siam University	
Usa Chaikledkaew	Mahidol	
Suppachai Insuk	NU	
Acharawan To-Pakngam	KKU	
Yaowared Chulikhit	KKU	

Workgroup Research Collaboration

Members	Institution	Charges
Surakit Nathisuwan	Mahidol	Develop a method for translational research collaboration (sharing basic and clinical sciences) between US and Thai institutions
Ed Moreton	Maryland	
Lee Kirsch	Iowa	
Pui-Kai (Tom) Li	Ohio State	
Pramote Tragulpiankit	Mahidol	
Duangdeun Meksuriyen	RSU	
Surachat Ngorsuraches	PSU	Develop a methodology to standardize short (0.5-1 year) research program in the US
Varaporn Junyaprasert	Mahidol	Determine ways to foster research collaboration
Pornsak Sriamornsak	Silpakorn	Create model collaborative research projects
Yon Rajanasakul	West virgenia	
Salisa Westrick	Auburn	
Earlene Lipowski	Florida	
Chidchanok Ruengorn	CMU	
Wandee Rungsrivijitprapa	UBU	
Sanguan Lerkiatbundit	PSU	
Chanuttha Ploylearmsang	MSU	
Suwapab Techamahamaneerat	Siam University	
Thanompong Sathienluckana	Siam University	
Montarat Thavorncharoensap	Mahidol	
Mullika Chomnawang	Mahidol	
Nanteetip Limpeanchob	NU	
Supatra Porasuphatana	KKU	
Natthida Weerapreeyakul	KKU	
Nutjaree Pratheepawanit	KKU	

Speaker Information

Sirada Maphanta, PharmD, MS, BCPS
Assistant Professor, Department of Pharmacy Practice
Faculty of Pharmaceutical Sciences
Naresuan University

Dr. Maphanta received a Doctor of Pharmacy degree from the University of Wisconsin-Madison. After six years of pharmacy school and two residency trainings positions, she joined the Department of Pharmacy Practice at Naresuan University as a faculty member. Dr. Maphanta served as department chair from 2008 to 2012, while also serving as assistant dean of hospital pharmacy service at Naresuan University Hospital's Faculty of Medicine. Dr. Maphanta has also served as a member of the Executive Board of the College of Pharmacotherapy of Thailand. Since 2012, she has been a visiting faculty member in the Office of Global Health at the University of Wisconsin-Madison School of Pharmacy. Her research and practice interests are health system pharmacy administration and critical care pharmacy.

Michael Katz, PharmD
Professor, Department of Pharmacy Practice & Science
Director, College of Pharmacy International Affairs
University of Arizona College of Pharmacy

Dr. Katz is a professor at the University of Arizona College of Pharmacy in the Department of Pharmacy Practice & Science. He practices at the University of Arizona Medical Center with the Department of Internal Medicine. His practice interests include general internal medicine, endocrinology, HIV/AIDS, infectious diseases, and evidence-based practice.
Dr. Katz teaches pharmacy and medical students in both the classroom and experiential settings. He was selected in 2001 as a Dean's Teaching Scholar by the Arizona Health Sciences Center and has received numerous teaching awards.
He is a past-chair of the American Society of Health-System Pharmacists Commission on Therapeutics. Dr. Katz has numerous publications, including *Pharmacotherapy Principles and Practice Study Guide: A Case-Based Care Plan Approach*.
He has been involved in international education and practice for more than 12 years and serves as the College of Pharmacy's Director of International Affairs. In 2010, he received the University of Arizona's prestigious Excellence in International Education Award. He has consulted and lectured extensively in Japan and other countries regarding pharmacy education and clinical pharmacy practice, and he serves on the Board of Directors of the U.S.-Thai Pharmacy Consortium. Dr. Katz directs the largest program of its kind to train clinical pharmacy faculty members from Saudi Arabia.

Surakit Nathisuwan, PharmD
Vice President, International Relations
Mahidol University

Dr. Nathisuwan received a Bachelor of Science in pharmacy from the Faculty of Pharmacy, Mahidol University in 1994 and a Doctor of Pharmacy degree from the University of Florida in 1999. He later completed a pharmacy practice residency at the Florida Hospital in Orlando and then did a residency in pharmacotherapy at the University of Texas Health Science Center at San Antonio. He became a board certified pharmacotherapy specialist in 2001. His main area of interest is cardiovascular pharmacotherapy. Dr. Nathisuwan served as the assistant dean for academic affairs at the Faculty of Pharmacy, Mahidol University from 2006 to 2008 and as deputy dean for international relations from 2008 to 2011. He is the University's vice president for international relations.

Bernard Sorofman, PhD
Division Head and Professor
University of Iowa

Dr. Sorofman received a Bachelor of Arts in anthropology from the University of Nevada and a Bachelor of Science in pharmacy from the University of Oklahoma. He then completed a PhD in social and administrative pharmacy at the University of Minnesota. Dr. Sorofman's research centers on health behavior theory in the context of treatment-oriented health care practices (actions) by patients. His studies are directed at the lay-oriented health care system. His second complementary research interest is on the system of pharmacy in society as it relates to access and impact on care. The content of Dr. Sorofman's research typically covers one or more of the following areas: self-care, pharmacy, gerontology, rural health care, medication adherence, and interdisciplinary teams.

Gary Oderda, PharmD, MPH
Professor and Director, Pharmacotherapy Outcomes Research Center
University of Utah
Director, Utah Medicaid Drug Regimen Review Center

Dr. Oderda was born and raised in northern California. His college education was completed at the University of California system including the Santa Barbara, Berkeley, and San Francisco campuses. He received his PharmD from the University of California at San Francisco in 1972 and completed an internship and residency in clinical pharmacy at the University of California Hospital in 1973. He received a Masters of Public Health in 1982 from the Johns Hopkins University School of Hygiene and Public Health.

His first professional position was at the University of Maryland School of Pharmacy where he served as director of the Maryland Poison Center and as a faculty member. He joined the faculty in 1973 as an instructor and had been promoted to professor by the time he left the University in 1991. While at the University of Maryland, he also served as acting assistant dean and had been promoted to professor by the time he left the University in 1991. While at the University of Maryland, he also served as acting assistant dean from 1989 to 1991. While a senior policy fellow at the School's Center for Drugs and Public Policy, he worked on a project to develop drug use criteria for use in Medicaid programs in the United States. In addition, he worked with the School's Student Committee on Drug Abuse Education on programs related to drug abuse.

In 1991, Dr. Oderda moved to the University of Utah where he served as professor and chair of the Department of Pharmacy Practice from 1991 to 1998. In addition to his responsibilities for administration of the department, teaching, and service, he was active in research involving the epidemiology of poisoning and drug use review.

On Jan. 1, 1999, Dr. Oderda began a sabbatical from the University of Utah and started as a visiting professor in the Department of Health Care Management at Novartis Pharmaceuticals Corporation in East Hanover, NJ. He was active in a variety of outcomes research and disease management projects. He returned to the University of Utah on Jan. 1, 2000, where he served as a professor and interim chair of the Department of Pharmacy Practice and conducted outcomes research. He currently serves as a director of the University of Utah Pharmacotherapy Outcomes Research Center.

Dr. Oderda developed a clerkship in Thailand for PharmD students from the University of Utah. The ninth group of students completed the clerkship in March 2014. The overall objectives of the clerkship are for students to learn about tropical medicine and health care in the developing world. The success of this clerkship has been accomplished by partnering with faculty at Chiang Mai University and Naresuan University. In addition to these clerkship activities, Dr. Oderda has worked on research collaborations in outcomes research and pharmacoeconomics with colleagues in Thailand and Malaysia.

Aliasger Salem, PharmD, MPH
Professor, Postdoctoral Fellowship
College of Pharmacy, University of Iowa

Alan Lau, PharmD
Professor, Department of Pharmacy Practice
Director, International Clinical Pharmacy Education
University of Illinois at Chicago College of Pharmacy

Dr. Lau received a Bachelor's of Pharmacy and a Doctor of Pharmacy degree from the State University of New York in Buffalo and completed a clinical care pharmacy residency at the University of Illinois at Chicago. He pioneered the development of clinical pharmacy services for renal failure patients on dialysis. He has obtained many research grants for clinical and laboratory research in renal pharmacotherapeutics and clinical pharmacology, with a recent focus on mineral and bone disorder in chronic kidney disease.

Dr. Lau was one of the founding members of the Nephrology Practice and Research Network of the American College of Clinical Pharmacy (ACCP). In addition, he has served on the Board of Directors and as chair of the Renal Scientific Section of the American Society for Clinical Pharmacology and Therapeutics. Dr. Lau was elected vice-chair of the Nephrology/Urology Expert Committee of United States Pharmacopeia (USP) in 2007. In 2010, he was named a Distinguished Practitioner in the National Academies of Practice in Pharmacy. In 2011, Dr. Lau was appointed by ACCP as its Professional Development Associate for International Programs.

With a passion for advancing global pharmacy education and practice, Dr. Lau has been invited to give lectures and organize many programs on pharmacotherapy and clinical pharmacy service and education development in various countries, including Japan, South Korea, China, Hong Kong, Taiwan, Thailand, Malaysia, Singapore, Vietnam, Philippines, Indonesia, Saudi Arabia, and Malta

Phayom Sookaneknun, PharmD, PhD
Assistant Professor
Associate Dean for Special Affairs and International Relations
Mahasarakham University

Dr. Sookaneknun is a lecturer in the clinical group at the Faculty of Pharmacy, Mahasarakham University (MSU), Thailand. She is associate dean for international relations and special affairs and is head of Primary Care Practice Research Unit. She received her BS in Pharmacy from Chulalongkorn University in 1995 and her PharmD degree from Mahasarakham University in 2001. She received a PhD in from Chiang Mai University in 2005 and completed a research fellowship at Robert Gordon University in Scotland.

Dr. Sookaneknun also serves as MSU's Pharmacy manager. She is chair of subcommittee for community pharmacy clerkship training for the Pharmacy Education Consortium Thailand (PECT) from 2013 to 2015. She is serving a three-year term on the committee of the Community Pharmacy Association (Thailand) and has served as a member of the committee of the Community Pharmacy Foundation since 2009. She led the Community Pharmacy Network for Health Promotion from 2011 to 2013. She received the Best Researcher Award in 2013 from MSU's Faculty of Pharmacy.

Dr. Sookaneknun's research focuses on community pharmacy practice in collaboration with the National Health Security Office and health related organizations and policy research for smoke-free work place environments.

Suphat Subongkot, MS, PharmD, BCPS, BCOP
Assistant Professor and Chair, Clinical Pharmacy Division
Faculty of Pharmaceutical Sciences, Khon Kaen University
President, College of Pharmacotherapy of Thailand

Dr. Subongkot is currently an assistant professor and chair of the Clinical Pharmacy Division at Faculty of Pharmaceutical Sciences, Khon Kaen University. His responsibilities include didactic teaching in an advanced pharmacotherapy course for undergraduate, master, and doctorate of clinical pharmacy students and providing oncology clinical pharmacy and clinical pharmacology service at Srinagarind Hospital KKU. He is also host of a board certification in pharmacotherapy training program and serves as a residency/fellowship coordinator under the College of Pharmacotherapeutics.

His past experiences involve clinical coordination with the medical team and oncology services at Rush University Medical Center in Chicago, teaching the experiential and didactic portion of the curriculum at the University of Illinois Chicago College of Pharmacy, precepting pharmacy students and residents, and conducting clinical research at Rush University Medical Center. He is the recipient of a National Institutes of HealthK-30 grant to participate in a clinical research training program for clinicians at Rush University Medical School from 2001 to 2003.

In 2006, Dr. Subongkot founded the Asia Pacific Oncology Pharmacy Society in Thailand and the first Asia Pacific Oncology Pharmacy Congress which is one of the premier events held biannually to support oncology pharmacy education among SEA regions. Recently, he was appointed president of the College of Pharmacotherapy of Thailand, an official residency program accrediting body in Thailand.

His main interest is targeted therapy for cancer treatment, especially the role of cyclo-oxygenase II and herbal drugs in treatment and prevention, pharmacogenomics, and cancer drug development. He is also interested in many palliative care issues emphasizing cachexia, nausea/vomiting, and nutrition in oncology patients. His ongoing research involves the use of olanzapine to improve emesis control, the effect of melatonin on breast cancer supportive care, effect on melatonin in alleviating radiation-related toxicities, and ginger in treatment-related cancer-cachexia.

Melody Ryan, PharmD, MPH, BCPS, CGP, FCCP, FAPhA
Associate Professor, Department of Pharmacy Practice and Science
Director of International Professional Student Education
University of Kentucky College of Pharmacy

Dr. Ryan received her PharmD and Masters of Public Health degrees from the University of Kentucky. She completed a pharmacy practice residency at Duke University and a neurosciences fellowship at the University of Kentucky (UK). She holds appointments as associate professor in the Department of Pharmacy Practice and Science at the UK College of Pharmacy and in the Department of Neurology at the UK College of Medicine. Her practice site is the neurology clinic at the Veteran's Affairs Medical Center in Lexington. She is the director of International Professional Student Education at the UK College of Pharmacy.

Dr. Ryan earned her certification in geriatric pharmacy in November 1998, and she attained board certified pharmacotherapy specialist status in 2000. She is a fellow of the American College of Clinical Pharmacy and the American Pharmacists Association (APhA). She also serves on the Medicare Model Guidelines Expert Panel for the United States Pharmacopeia. She is president of the American Pharmacists Association – Academy of Pharmaceutical Research and Science. She is a member of APhA's Board of Trustees and the board of the College of the Psychiatric and Neurologic Pharmacists Foundation.

Somkid Janeklang, PhD

Suthiporn Pattarachaiyakul, PharmD, BCPS

Thitima Doungngern, PharmD, BCPS

Khunjira Udomaksorn, PhD

Janet Engle, PharmD, PhD (Hon), FAPhA, FNAP

Paul Jungnickel, PhD

Sawaeng Watcharathanakit, PhD

Randell Doty, PharmD

Chanuttha Ploylearmsang, PhD

Chidchanok Ruengorn, PhD

Pui Kai Li, PhD

Pornsak Sriamornsak, PhD

Marilyn Speedie, PhD

Donald Letendre, PharmD,

Preecha Montakantikul, PharmD, BCP

Rungtiwa Muenpa, PhD

Tanatape Wanishayakorn

Surasak Saokaew, PhD

Suppachai Insuk, PharmD, BCPS

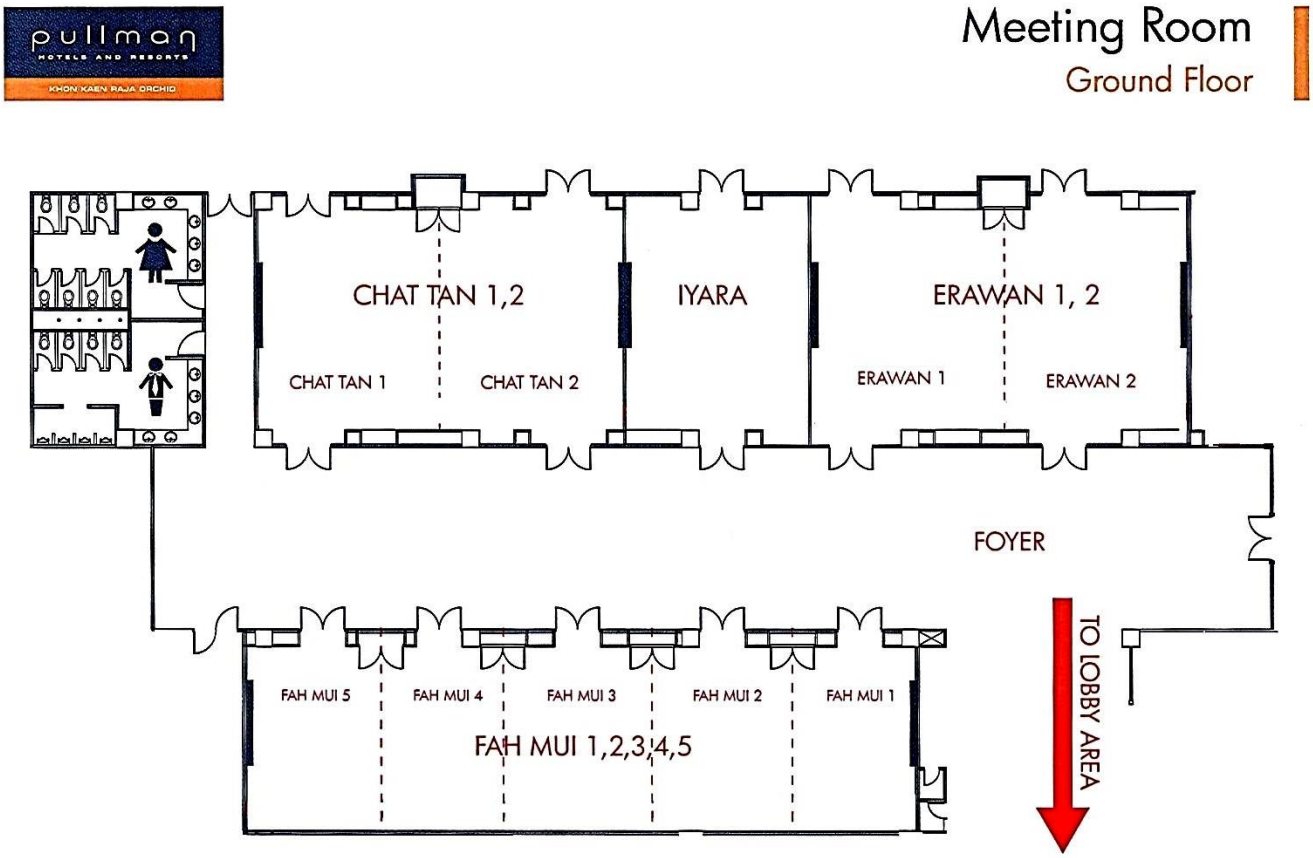
Itsarawan Sakunrag, PharmD, BACAP

Douglas Slain, PharmD

Plan / Function Room

Pullman Raja Orchid Hotel, Khon Kaen

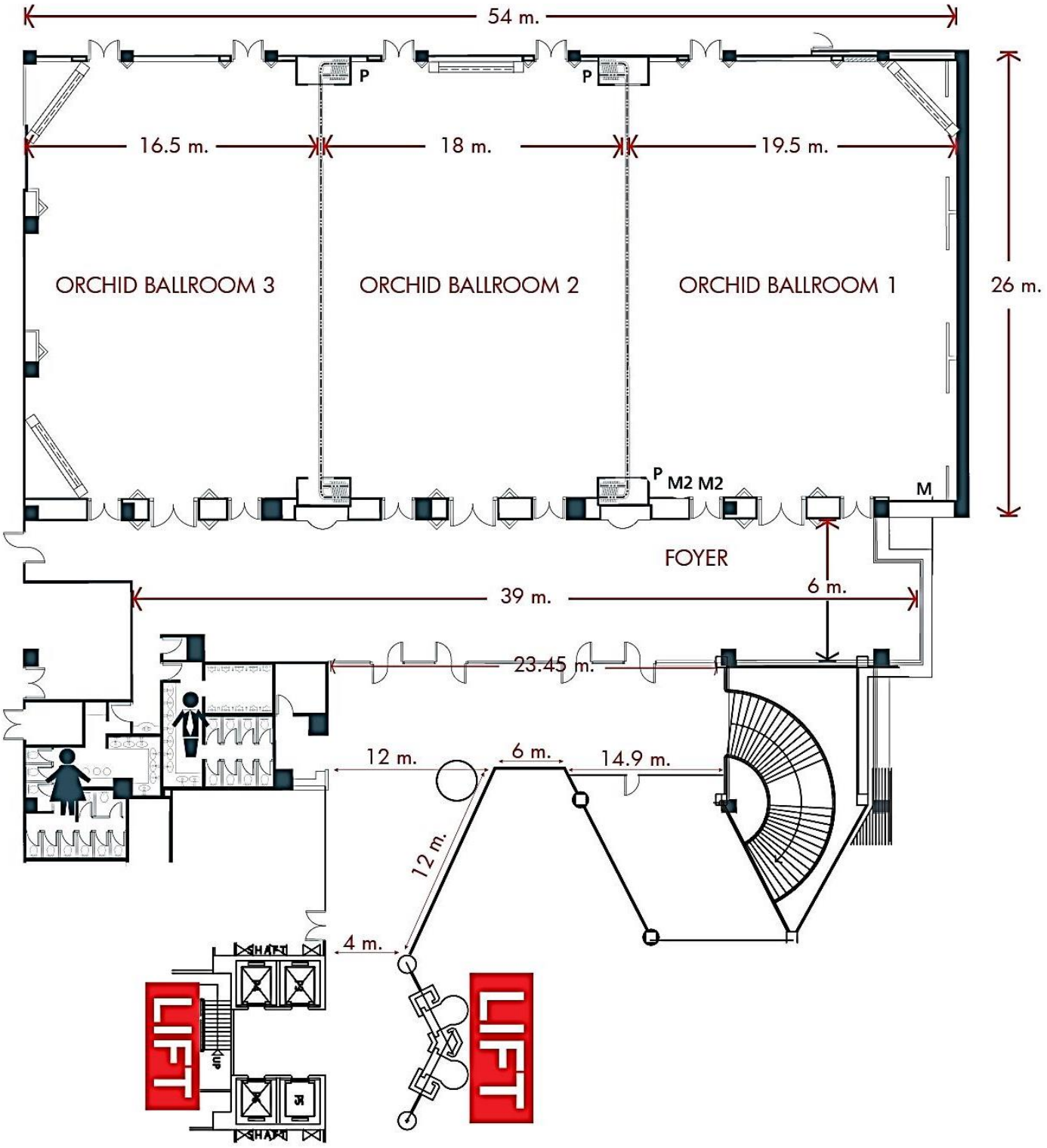
1st Floor



Plan / Function Room

Pullman Raja Orchid Hotel, Khon Kaen

2nd Floor



Clinical Pharmacy

(Full Paper)

01-CP Original Article

Management of Adverse Reaction in Patients with HIV-infection at a university hospital of Thailand

Thanida Nuntasaen[1], Ratchadaporn Soontornpas[1], Piroon Mootsikapan[2], Cheardchai Soontornpas[3]*

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Abstract

Management of Adverse Reaction in Patients with HIV-infectionat a university hospital of Thailand
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Background: Adverse drug reaction (ADR) or adverse reaction (AR) is a primary domain of drug-related problem that causes patient suffers, or will possibly suffer. Intensive monitoring of adverse drug event and Pharmaceutical Care Network Europe (PCNE) classification may be useful for managing with AR in patient with human immunodeficiency virus (HIV) infection
Objective: To explore and solve adverse reaction in patient with HIV-infection.
Method: The study was descriptive, cross-sectional study performed in patient with HIV infection at Srinagarind Hospital, KhonKaen University between 1 December 2013 and 28 February 2014. Intensive AR monitoring by structural questionnaire and chart review was used for data collection. Ars were assessed according to PCNE classification v. 6.2. Then, all data were analyzed and presented using descriptive statistic.
Results: From 340 patients, 125 Ars were detected in 64 patients. Adverse drug events (non-allergic) were the major Ars and accounted for 117 Ars in 56 patients. Either adverse drug events (allergic) or toxic adverse drug events were accounted for 4 Ars in 4 patients. Clinical pharmacist performed recommendations to physicians and patients to solve Ars in 10 and 54 patients, respectively. Outcomes of intervention classified as solved, partially solved, not solved and not known were 25.0, 48.4, 17.2 and 9.4% of Ars, respectively.
Discussion: Intensive AR monitoring and PCNE classification were useful methods for management of Ars. Then, clinical pharmacist could give recommendation about alternative drug regimen to the physicians or counsel the patients to correct or avoid the adverse drug event.

Keywords: adverse reaction, HIV-infection, PCNE

Background

Human Immunodeficiency virus (HIV) infection is a chronic infectious disease which becomes a big problem worldwide and require suitable management. Treatment in patients with HIV infection includes antiretroviral and other medication for opportunistic infection so that pharmacotherapy must be life-long. However, the drawback of treatment outcome may belong to drug-related problems especially adverse drug reactions (ADR) that causes patient suffers, or will possibly suffer, from an adverse drug event. As, Srinagarind Hospital is a medical school of Khon Kaen University, there is about 2,000 registered HIV-infected patients which are more severe and complicated cases. Therefore, clinical pharmacist in HIV clinic must work hard in the healthcare team for the better patients' outcome. Intensive monitoring of and Pharmaceutical Care Network Europe (PCNE) classification may be useful for managing with Ars in patient with human immunodeficiency virus (HIV) infection.

Objective

The purpose of the study was to explore and solve adverse reaction in terms of adverse drug event (non-allergic), adverse drug event (allergic) and toxic adverse drug event in patient with HIV infection at Srinagarind Hospital.

Method

The study was descriptive, cross-sectional study performed at HIV clinic between 1 December 2013 and 28 February 2014.

Subject

Population was the patient with HIV-infection diagnosed and treated at Srinagarind Hospital. Subject would be included if their age was over 18 year old, continuously took antiretroviral drug for at least 6 month and had good consciousness, ability to talk and interact. This study was reviewed and approved by the KhonKaen University Ethics Committee for Human Research reference number HE561388. Sample size was estimated from population by using following equation (Yamane, 1967)

$$n = \frac{N}{1 + Ne^2}$$

Where, n was sample size, *N* was population size, *e* was the level of precision. When, the number of registered HIV-infected patients at this clinic ware about 2,000 in 2013 and the acceptable deviation from sampling is 5% with 95% of confidence, sampling of 333 cases would be sufficient. Finally, we added more sample to compensate the incompleteness so that the sample size would be 340 patients.

Data collection

Intensive AR monitoring was used in this study. Briefly, when the patients had follow-up visiting at HIV-clinic, they would be asked to fill up the structural questionnaire. During the patient counseling process, pharmacist would provide pharmaceutical care including the suggestions, medication consulting, and resolution to the drug-related problems as well as knowledge delivery about the medication usage, the disease, and well practice. All problems and solutions would be noted in the medical records. Thereafter, the researcher will inspect for the correctness and completeness of the data as well as collect the additional information from the outpatients' records and pharmaceutical database to fulfill the data. The acquired data were analyzed using descriptive statistics and presented as number and percentage.

Result

There were 340 patients recruited into the present study which were 184 male (54.1%) and 156 female (45.9%) and the average aged of patients was 42.6 years. The average duration of infection and antiretroviral therapy were 8.4 and 6.8 years, respectively. There were 36 HIV-infected patients (10.6%) had opportunistic infection. The most common antiretroviral regimen was TDF+3TC+EFV which was used in 73 patients (21.5%) (Table 1). From 340 patients, there were 125 Ars detected in 64 patients. Adverse drug events (non-allergic) were the majority were 117 Ars in 56 patients. Either adverse drug events (allergic) or toxic adverse drug event was 4 Ars in 4 patients (Table 2). Fifty 50 side effects (42.7%) were belonged to antiretroviral drugs. The most common side effect was nausea/vomiting (18.8%) followed by hyperlipidemia (11.1%) and lipoatrophy (10.3%). To find out the cause of drug allergy and toxicity, Naranjo's

algorithm was used along with the Handbook on Essential of HIV/AIDs Treatment and Prevention 2014. All 4 drug allergy were presented as macula-papular rash which were caused by tetracycline, cotrimoxazole, rifampicin, and isoniazid/rifampicin/pyrazinamide/ethambutol combination, each. Hepatotoxicities were belonged to 3 drugs; nevirapine, efavirenz, and combination of isoniazid/ rifampicin/pyrazinamide/ethambutol and Fanconi syndrome was found in a patient receiving tenofovir. Pharmacist had solved these ADRs by performing doctor intervention and patient counseling in 10 and 54 patients, respectively. Outcomes of intervention classified as solved, partially solved, not solved and not known were 25.0, 48.4, 17.2 and 9.4% of Ars, respectively. (Table 3)

Table 1. Patients' Characteristics

Characteristics	Value
Demographic data	
Gender (male, female)	184 : 156
Age (mean ± SD, range)	42.6 ± 10.2 yr, 19-71 yr
Clinical data	
Duration of infection (mean ± SD, range)	8.4 ± 5.1 yr, 0.6-22.2 yr
Duration of antiretroviral (mean ± SD, range)	6.8 ± 4.3 yr, 0.5-20.0 yr
CD4 count (mean ± SD, range)	457.5 ± 239.4 cell/μL, 6-1,343 cell/μL
Opportunistic infection (case, %)	**36 (100.0)**
Tuberculosis	20 (55.6)
Pneumocystis pneumonia	8 (22.2)
Cryptococcal meningitis	2 (5.6)
Herpes zoster virusInfection	2 (5.6)
Cytomegalovirus retinitis	1 (2.8)
Mycobacterium avium complex	1 (2.8)
Others	2 (5.6)
Antiretroviral regimen (case, %)	**340 (100.0)**
TDF + 3TC + EFV	73 (21.5)
AZT + 3TC + NVP	63 (18.5)
TDF / FTC + EFV	46 (13.5)
AZT / 3TC + EFV	22 (6.5)
TDF + 3TC + NVP	20 (5.9)
TDF / FTC + NVP	13 (3.8)
TDF + 3TC + LPV / RTV	11 (3.2)
TDF + 3TC + ATV + RTV	8 (2.4)
Others	84 (24.7)
Adherence to antiretroviral (case, %)	**340 (100.0)**
≥ 95	249 (73.2)
90 – 94	59 (17.4)
80 – 89	26 (7.6)
<80	6 (1.8%)

Note: TDF (Tenofovir); 3TC (Lamivudine); EFV (Efavirenz); AZT (Zidovudine), NVP (Nevirapine);FTC (Emtricitabine); LPV (Lopinavir), RTV (Ritonavir), ATV (Atazanavir)

Table 2. Adverse reactions found with HIV-infected patients

Adverse reactions	Number of patients (%)
Adverse drug event (non-allergic)	56 (87.6)
Gastrointestinal system	39
Mitochondrial dysfunction system	17
Nervous system	16
Skin system	5
Respiratory system	5
Other	35
Adverse drug event (allergic)	4 (6.2)
Toxic adverse drug event	4 (6.2)
Total	**64 (100)**

Table 3. Outcome of intervention for adverse reaction solving according to PCNE classification

Outcome of intervention	Number of intervention (%)		
	Physician	**Patient**	**Total**
11. **Not known**	0	6	6 (9.4)
Outcome intervention not known			
2. Solved	4	12	16 (25.0)
Problem totally solved			
3. Partially solved	5	26	31 (48.4)
Problem partially solved			
4. Not solved	1	10	11 (17.2)
Lack of cooperation of prescriber/patient			
Total	**10**	**54**	**64**

Discussion

During the study period, 18.8% of patients presented AR which was nearly to report in India and Cameroon where the prevalence of Ars were 17.5% and 19.5%, respectively (Modayils, *et al*. 2010; NammeLuma H *et al*., 2012). However, the finding was markedly lower than reports in Kenya and Ethiopia in which they reported Ars in 40.6 % and 70.8% of patient, respectively (Hawkins,*et al*. 2007; Tatiparthi and Mama, 2014). Moreover, the prevalence rate 1.9 Ars per patient in this study also less than 5.6 Ars per patient reported by Reddy *et al*. (2013). The variations may be come from different ARV regimen and concurrent medications for treating opportunistic infections and other co-morbid conditions which may results in increase of ADRs incidences. However, the prevalence rate of ADR in this study was higher than 0.1 Ars per patient in previous study at the same hospital (Wisai *et al.*, 2006). The difference may be come from different method for AR assessment since intensive AR monitoring by questionnaire and chart review were used instead of patient interview in previous study. The prevalence of adverse events reported by standard questionnaire was higher than that reported spontaneously during interviews (Rosenthal *et al.*; 1996). Clinical pharmacist in HIV clinic could help solving all Ars in the patients with HIV infection by giving intensive counseling to 54 patients to avoid the adverse drug reaction (non-

allergic) and recommending alternative drug regimen for 10 patients to the physicians. However, outcomes of interventions classified as solved, partially solved and not known were 25.0, 48.4 and 9.4% Ars, respectively. There were 11 intervention (17.2%) with not solved because the physician insisted to prescribe efavirenz in 1 patient with CNS side effect; meanwhile, the others belonged to unconcern and deny of the patients to intensive counseling. In conclusion, intensive AR monitoring and PCNE classification system for DRP were useful for managing Ars in HIV-infected patients. Most of interventions were accepted by the physician but sometimes unaccepted by the patients.

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Clinical Pharmacy

(Abstract)

02-CP Abstract

Patient Reporting of Adverse Drug Reactions to Methylphenidate in Treatment Attention Deficit Hyperactivity Disorders in A Tertiary Hospital, Thailand

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Abstract

Patient Reporting of Adverse Drug Reactions to Methylphenidate in Treatment Attention Deficit Hyperactivity Disorders in A Tertiary Hospital, Thailand

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Background: Methylphenidate (MPH) is the main drug used in ADHD requiring long term treatment which consequently may cause serious adverse drug reactions (ADRs). Monitoring of ADRs relies on spontaneous reports of health professionals, which yield reliable information. There are still no patient's self-report to assist in following up of ADRs, which will increase reports of unwanted reactions that are difficult to detect.

Objective: To determine the frequency of ADRs to Methylphenidate (MPH) by the reports of patients in the frequency and to evaluate factors associated with the number of reported.

Methods: This was a cross-sectional descriptive study, data was collected retrospectively from outpatients who were $\geq$ 7 years and were prescribed MPH during June 12, 2013 - September 12, 2013 at Srinagarind Hospital. Patients and/or their parents were asked to report patients' conditions by using symptom checklist questionnaire. The questionnaire was adapted from previous study of Jarernsiripornkul *et al*., 2002. Assessment of factors influences patients reporting at least one symptom by using chi-square test and multivariate analysis.

Results: Of the total 644 questionnaires distributed, 644 responded questionnaires (100%) consisting of 620 respondents (96%) by parents and 24 respondents (4%) by patients themselves. There were 604 (93.8%) valid responses obtained plus 40 responses considered invalid, due to lack of completion (N=9, 22.5%), failure to take the prescribed index drug (N=9, 22.5%), and missing of OPD card (N=22, 55%). The average age was 40.30 $\pm$ 7.73 years. The majority of respondents were female (52.2%) and the common education level of respondents were bachelor (88.9%) and high school (5.5%). Of the total 604 respondents, 508 (84.1%) reported at least one symptom. The top five symptoms that the severity had bothered patients' lifestyle were appetite decreased (45.7%), constipation (16.0%), headache (14.6%), insomnia (12.0%) and nausea (11.7%) Age, number of underlying diseases and concomitant drugs were associated with frequency of reporting at least one symptom ($p=0.004$, 0.043 and <0.001 respectively).

Discussion: This study suggests that patient reporting is a useful method in detecting and monitoring ADRs for drugs used in long term treatment, particularly in children. The results from this study showed that the difference in age, number of underlying diseases and concomitant drugs may influence patients reporting at least one symptom. With this, incorporating self-reporting ADRs into routine work can be an effective way of developing methods for evaluating adverse reactions reported by both patients and physicians.

Keywords: adverse drug reactions; self-reporting; ADHD; methylphenidate

03-CP Abstract

The Impact on Quality of Life of Cancer Patient's Family Members at Chemotherapy Ward (5E) Srinagarind Hospital, Faculty of Medicine, Khon Kaen University

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Abstract

The Impact on Quality of Life of Cancer Patient's Family Members at Chemotherapy Ward (5E) Srinagarind Hospital, Faculty of Medicine, Khon Kaen University

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Background: Cancer is a chronic disease that has an impact not only on the quality of life (QoL) of patient but their family. Family members may find their own quality of life affected, as they may need support and attention.

Objective To evaluate the factors that affect the quality of life of cancer patients' family members who received the treatment at ward 5E in February – March 2016.

Methods: This cross-sectional descriptive study's using the Family Reported Outcome Measure (FROM-16) Thai version. Multivariable linear regression assessed the relative impact of each factor on quality of life scores.

Results: There were 100 participants (power 26.8%), mean of age was 45.53 years (18-68 years), 29% were male and 71% were female. Relationship with patient was mostly spouse, couple; 43%, education level was mostly lower than secondary education; 37%, occupation was mostly agriculture/livestock/fishery; 35%, monthly income was mostly less than 5,000 baht; 43%, average increased expense was 8,150 baht per month (0-50,000 baht), the adequacy of income was mostly inadequate; 46%, caregiver role was mostly main caregivers; 76%, average duration of patient care per day was 9.72 hours (2-24 hours), type of cancer was mostly Cholangiocarcinoma; 18%, and stage of cancer was mostly stage 4; 59%. The results are divided into two parts (domains). Part 1 (emotional domain) scores (total score = 12), part 2 (personal and social life domain) scores (total score = 20) are 4.64 (1-12) and 7.41(0-19). Overall scores (total score = 32) are 12.05(2-31) scores respectively by the higher total scores, the greater effect that related to the lower quality of life. So the impact on Quality of life in emotional domain are effected lower than personal and social life domain.

Conclusion: Factors which affected patients' family members to have a lower quality of life by have significance were the adequacy of income and increased expense. It was found that the group with inadequate income had the average scores of the impact on the overall quality of life equal to 14.11 scores that related to the low quality of life ($p = <0.001$) and the increased expense was moderately associated with the impact on quality of life ($r = 0.294$, $p = 0.003$). On the other hand, the factors including gender, age, relationship with patient, marital status, underlying diseases, educational level, occupation, monthly income, family income per month, caregiver role, the ability to do daily activities of patient, duration of patient care per day, status before illness, healthcare scheme, type and stage of cancer, duration of disease and current treatment were not significant. There are limitations to identify the factors affecting the quality of life because the number of the family members is small, therefore, should be done in a larger sample sizes.

Keywords: Impact of Disease; Family; Quality of Life; Cancer; FROM-16

04-CP Abstract

Antimicrobial Use for Treating Multidrug-Resistant *Acinetobacter baumannii* infection at Srinagarind Hospital

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Abstract

Antimicrobial Use for Treating Multidrug-Resistant *Acinetobacterbaumannii*infection at Srinagarind Hospital
Wilaiwan Rojkulpanichakul[1], Keeratikan Thammasarangkoon[1], Ratchadaporn Soontornpas[2], Prajuab Chaimanee[3], Piroon Mootsikapun[4], Cheardchai Soontornpas[5]*
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Background: Multidrug resistant *Acinetobacter baumannii* (MDRAB) has been the most common cause of nosocomial infection worldwide including Thailand and treatment is problematic resulted from variety in antimicrobial resistance. Antimicrobial susceptibility data is a very useful data for purposing the antimicrobial regimen in the patient with MDRAB infection.

Objective: This study aims to explore antimicrobial susceptibility pattern of MDRAB, explore antimicrobial regimen for treating MDRAB infection, and assess the outcomes of antimicrobial therapy in infected patients.

Method: This retrospective study collected data from hospitalized patient with MDRAB infection at Srinagarind Hospital from January 2015 to September 2015. Antimicrobial susceptibility data were collected from electronic database and antimicrobial regimen and therapeutic monitoring parameters were collected from patients' medical record. Data about antimicrobial susceptibility data and regimens were analyzed using descriptive statistic and data about the clinical outcomes data were analyzed among different antimicrobial regimen using Chi-square statistic.

Results: There were 2,173 isolates of *A. baumannii* during the study period, of this 1,644 isolates from 541 patients were MDR strains. All of MDRAB ware susceptible to colistin (100%) and most of them susceptible to tigecycline (91.3%); meanwhile, over 80% of MDRAB resisted to other antimicrobials including sulbactam combination and carbapenems. There were 240 patients included in the study and 57.1% were male. The mean age was 63.4 years. Almost 80% of patients were diagnosed with lower respiratory infections. The average length of stay was 38.2 days. Monotherapy was mostly used in 156 patients (65.0%) and antimicrobial combination was used in the remaining 84 patients (35.0%). The most common antibiotics in monotherapy were colistin or meropenem. For the outcome, majority of patients (80.8%) showed improvement after receiving antimicrobial therapy with regardless to the antimicrobial susceptibility (P=0.830).

Conclusion: Colistin was the best choice for treating MDRAB infection because it not only showed the highest activity rate against MDR strains, but also yield high favorable clinical outcome. However, susceptibility test might not be the key factor for successfulness of treatment, other conditions such as patient's status and drug safety should also be concerned in antimicrobial regimen selection.

Keywords: multidrug-resistant, *Acinetobacter baumanni*

05-CP Abstract

Review of Human Albumin Utilization at Srinagarind Hospital

Phakapan Bowornkasintum[1], Praewa Vimokchareon[1], Cheardchai Soontornpas[2]*, Ratchadaporn Soontornpas[3], Peingpen Chanathepaporn[3], Somsak Tiamkao[4]

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Abstract

Review of Human Albumin Utilization at Srinagarind Hospital

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Background: Human albumin has been used in various clinical conditions; however, unnecessary use has been documented in many studies. In Thailand, national guideline for albumin use has not been established. Only the criteria based guideline was developed for using in individual institutions including Srinagarind Hospital. Human albumin order form has been used in Srinagarind Hospital to control the prescribing and promote the rational drug use.

Objective: This study aimed to assess the complying to control measure for human albumin prescribing in Srinagarind Hospital.

Method: Data were collected retrospectively from human albumin order form and patient medical record in the patients admitted at Srinagarind Hospital during November 2015 to February 2016. The completeness of data filled in order form and the consistency of data with data in patient medical record were assessed. All data were analyzed and reported using descriptive statistic.

Results: There were 221 human albumin order forms available during the study period, but only 103 order forms were recruited into the study. Albumin was mostly used in patients with severe septic shock as fluid resuscitation (52.4%), followed by abdominal paracentesis (14.6%) and nephritic syndrome (9.7%). Complete order forms were found in 85 forms (82.52%). Uncompleted order forms (17.5%) were belonged to the absence of required laboratory data. Information was consistent in all items in 37 prescribing (35.9%) and 34 forms (33%) of prescribing could not be assessed.

Conclusion: Prescribing of human albumin was complied with the hospital control measure. Most of the order forms were completely fulfilled; however, the consistency was still in question due to lack of data.

Keywords: Human albumin, Order form

06-CP Abstract

Monitoring and evaluating of the anti-osteoporosis drug use at Srinagarind Hospital

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Abstract

Monitoring and evaluating of the anti-osteoporosis drug use at Srinagarind Hospital

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Introduction: In Fiscal year 2013, the Comptroller General's Department (CGD) had launched the Non-essential Drug Prescription Criteria (NPC) measure and the Working Group for Determining the Practice Guideline and Indication of High Cost Non-essential Drug (WGDPG) had launched the recommendation on indication for high cost non-essential drug to encourage the rational drug use and control drug cost for patients under the Civil Servant Medical Benefit Scheme (CSMBS) in 168 public hospitals.

Objectives: This study aimed to evaluate the complying with the NPC measure and rationality of non-essential drug prescribing in anti-osteoporosis group.

Methods: This retrospective study was conducted by gathering the information about NPC measure from the electronic database and details about clinical presentation or drug utilization supporting the use of non-essential drug from the medical records of the out-patients with CSMBS who received anti-osteoporosis drug at Srinagarind Hospital between August 1st and September 30th, 2014. Data were analyzed by descriptive statistics.

Results: There were 463 patients recruited in the study. Patients were mainly female (94.2%) and aged over 65 year (70.2%). The top three highest prescribing drugs belonged to alendronate plus cholecalciferol, followed by risedronate and ibandronate (41.7, 22.9 and 11.0%, respectively). The most common specified NPC were item C (no essential drugs available and the patient needed non-essential drug which its indication being approved by Food and Drug Administration), followed by item B (the treatment cannot be accomplished by previous essential drug use) and item A (adverse drug reaction or allergy occurred with previous essential drug use) and accounted for 76.5, 17.7 and 4.7%, respectively. None of details about clinical presentation or drug utilization supporting the use of non-essential drug instead of essential drug presented in the medical records. Prescribing was rationale and irrational in 56.4% and 25.7%, respectively; meanwhile, the rationality could not be assessed in 17.9% of prescribing because of data lacking in the outpatient medical record.

Conclusion: Prescribing of anti-osteoporosis drugs was generally complied with the NPC measure despite the data was indicated only in the electronic database. Moreover, prescribing was mostly rationale according to the recommendation on indication for high cost non-essential drugs.

Keywords: non-essential drug; anti-osteoporosis drug

07-CP Abstract

The Quality of Life in Palliative Patient Using Modified McGill Quality of Life Questionnaire

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Abstract

The Quality of Life in Palliative Patient Using Modified McGill Quality of Life Questionnaire

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Background: Quality of life (QOL) has become an important aspect for evaluating patient treatment outcome in palliative care settings where physical function declines. This study mainly aims to evaluate QOL using the Modified McGill Quality of life Questionnaire.

Objective: The purposes of this prospective cohort study were to evaluate quality of life and identify QOL domain that significantly correlated to overall quality of life of the palliative care patients.

Method: Data was collected from palliative patients in ward 5E at Srinagarind hospital from March-April 2016. The questionnaire contains a global and 17 itemized questions allocating in 4 related domains including Physical Domain (Item 1-4), Psychological Domain (Item 5-8), Existential Domain (Item 9-14), and Relationship Domain (Item 15-17). The inter-rater reliability of 3 investigators was conducted using intra-class correlation with Chronbach's alpha of 0.903. The correlation between global score and average score of each domain was calculated using spearman's rho correlation.

Result: 30 patients were enrolled in the study including 18 males (60%) and 12 females (40%) with age ranging from 26 to 75 years old. Subjects were 63.33% married and 18.67% single. Health insurances of the subjects were Universal Coverage (63.33%), Government or Enterprise officer (20%), Social Security (10%), and Self-payment (6.67%). Average global score was 6.53±2.27, and the average scores of physical, psychological, existential, and relationship domains were 8.51±1.78, 8.01±1.89, 7.57±1.84, 8.82±1.77, respectively. The correlation between global score and existential domain was 0.395 (p-value 0.03), while there was no significant correlation among domains.

Conclusion: Modified McGill Quality of Life Questionnaire could potentially use to assess quality of life and reflect outcomes of treatment in palliative setting. The result showed correlation between global score and average score in existential domain but more patient enrollment is required to gain statistically significant results among other QOL domains.

Keywords: Quality of Life; Palliative patients; Modified McGill Quality of Life

08-CP Abstract

Effect of Carbapenems on Serum Concentration of Valproic Acid and Duration of Drug Interactions

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Abstract

Effect of Carbapenems on Serum Concentration of Valproic Acid and Duration of Drug Interactions
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Background: Carbapenems can decrease the serum Valproate (Valproic acid; VPA) levels during concomitant use. Several cases have been reported potential effect of this interaction which occurs with rapid onset and led to uncontrollable seizure in some patients.

Objective: To study the effect of carbapenems on the serum VPA levels in epileptic patients and determine the decreasing trend of VPA during concomitant use with carbapenems and its increasing trend after discontinuation of carbapenems.

Methods: A retrospective study was conducted from year 2005 to year 2010 in patients who used continuous infusion VPA concomitantly with carbapenems. The data of VPA serum concentration measured during or after co-administration were collected and analyzed.

Results: Data from thirty-seven cases of patients who concomitantly used VPA with carbapenems was analyzed. During concomitant use, the result revealed that the average level of VPA serum significantly reduced by 78.6% compared to the baseline ($p<0.001$). The effect of drug interaction on decreasing serum VPA level were found from 47.76% to 100% from baseline level. The average onset of reduction of serum VPA level was 5 days, and the rapid onset was found since day 2 of concomitant use of VPA with carbapenems. Seventy-five percent of cases had serum VPA level decreasing over fifty percent in the first week. During co-administration of VPA and carbarpenems, the average of serum VPA level decreased in three days, one week and over one week were 75.45% (±15.77%), 79.09% (±18.83%), and 83.15% (±16.65%), respectively. After discontinuation of carbapenems, the serum VPA levels increased by 63.90% (±25.35%) from baseline. Sixty percent of patients had over fifty percent serum VPA level increasing within first week and full recovery within 2 weeks, and the average onset of increasing of serum VPA level was day 7 (day 1 – day 22). The serum VPA levels after discontinuing co-administration during the first week and more than one week were increased to 56.30% (±24.30%) and 78.03% (±22.28%), respectively.

Conclusion: The potential effects of the carbapenems resulted in decreasing VPA serum level. Without dosage adjustment of VPA, add-on therapy with other antiepileptic drugs might be considered in this case. After discontinuation of carbapenems, the VPA serum levels increased to baseline within two weeks. Therefore, tapper-off of other add-on antiepileptic drugs should be planned. Further study of appropriate antiepileptic drugs as an add-on therapy during drug interaction between VPA and carbapenems should be performed.

Keywords: Carbapenems; Valproic acid; Drug interaction; Antiepileptic drug; Serum valproic acid level

09-CP Abstract

A Retrospective Study of Oral Medicine Use in Trigeminal Neuralgia Patients

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Abstract

A Retrospective Study of Oral Medicine Use in Trigeminal Neuralgia Patients

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Background: Trigeminal Neuralgia (TN) is a condition of chronic facial pain which can be physically and mentally incapacitating. TN affects the trigeminal or the 5th cranial nerve. Treatment options are medications including anticonvulsants and tricyclic antidepressants as well as surgery. In Thailand, treatment with medications is more common among TN patients.

Objective: To study the pattern of oral medicines used and the reasons that altered a pattern of treatment.

Methods: A retrospective study was conducted in outpatients who had received oral medication treatment from a university hospital (UHosp) and orofacial pain clinic (OroC) during 1 January to 31 December 2014. The patients who underwent surgery or not taking any medications were excluded from data collection.

Results: The data was collected from a total of 176 patients, 81 patients from UHosp and 95 from OroC. Most of patients were female (75.6%) and mean age was 61.78±13.90. Majority of the patients (77.6%) was initially treated with monotherapy. Among these, carbamazepine (CBZ) and oxcarbazepine (OXC) were the most common drugs used as monotherapy (66.9% and 18.4%, respectively). Approximately 19% from total were treated with dual therapies and the common combinations were CBZ plus amitriptyline (32.4%), gabapentin plus amitriptyline (26.4%) and CBZ plus gabapentin (14.7%). Approximately one-third of the patients had been changed in a pattern of therapy, including additional treatment, switching drugs or discontinuation. The common reasons for the change were due to refractory pain (45.7%), allergy to CBZ (17.1%) or OXC (5.7%), clinical improvement (14.2%) and intolerability of CBZ (5.7%).

Conclusion: CBZ and OXC were commonly used as monotherapy or in combination treatment. The reasons for alteration of treatment pattern were refractory pain, allergy/intolerability and clinical improvement.

Keywords: Trigeminal neuralgia, facial pain, anticonvulsants, tricyclic antidepressant

10-CP Abstract

Clinical Outcome of Type 2 Diabetes Mellitus and Hypertension Treatment at District Hospital

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Abstract

Clinical Outcome of Type 2 Diabetes Mellitus and Hypertension Treatment at District Hospital
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The objective of this study was to evaluate clinical outcome of type 2 diabetes and hypertensive patients in district hospital. The retrospective study was conducted by analyzing hospital electronic records of Yang Talat hospital, Kalasin, between 31 December 2011 and 31 December 2014. The indicators of study included incidence, prevalence, percentage of good clinical outcomes among type 2 diabetes and hypertension, the cost of drug usage. Total subjects were 9,656 patients, 4,333 were diabetic patients (1,648 male and 2,685 female), 2,980 were the hypertensive patients (1,243 male and 1,737 female), 2,343 patients had both diseases (708 male and 1635 female). The prevalences in the year 2014 of Type 2 DM, Hypertension and both diseases were 298.11, 194.58 and 165.13 per 10,000 persons per year, respectively, the incidences were 47.87, 43.79 and 4.55 per 10,000 persons per year, respectively. We used Thailand guidelines for hypertension 2012 and DM 2011 as a criteria of treatment outcomes. In Type 2 DM group, we found that the average percentage of fasting blood sugar control was 38.68% (1.93 times from last observed 5 times) and HbA1c was 25.40% (1.27 times from last observed 5 times). The hypertension (HT) group had the average percentage of number of blood pressure control 68.75% (6.88 times from last observed 10 times), and The DM+HT group had the average percentage Fasting blood sugar, HbA1c and blood pressure in target = 50.40% (2.52 times from last observed 5 times), 34.63% (1.73 times from last observed 5 times) and 36.53% (3.65 times from last observed 10 times), respectively. In DM group, The highest number of prescribed medication and cost in 3 years were Biguanide = 6,462,084 tablets, which cost 6,462,084 Baht. The hypertension group, The highest number of prescribed medication and cost in 3 years were Calcium channel blocker = 3,662,123 tablets, which cost 5,663,202 Baht.
The Type 2 DM group had a low rate of success in controlling of fasting plasma sugar and HbA1c level (38.68% and 25.40%, respectively). The hypertension group had a higher rate in blood pressure control (68.75%). The both diseases group, the percentage of fasting blood sugar control was higher than the Type 2 DM only group, but lower rate of success in blood pressure control than hypertension only group.

11-CP Abstract

Quality of life in cancer patient undergoing chemotherapy and receiving ginger extract as daily supplement

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Abstract

Clinical Outcome of Type 2 Diabetes Mellitus and Hypertension Treatment at District Hospital
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Background: The measurement of patient's QOL in cancer patients consists of several domains including physical, psychological, social, and behavioral components [1,2]. It is an important clinical decision-making tool in optimizing patient care [1,3]. Chemotherapy-induced nausea and vomiting (CINV) is a common symptom most concerned by patients [4] and appears to compromise patient's quality of life [5]. Ginger (*Zingiber officinale Roscoe*) is a medicinal plant containing active compound gingerols that have been demonstrated to reduce CINV [6].

Objective: To examine the impact of ginger extract as daily supplement on quality of life in solid tumor patients undergoing moderately to highly emetogenic adjuvant chemotherapy.

Methods: Patients were randomly assigned to receive ginger extract (standardized 6-gingerol) 10 mg or placebo orally twice daily. The treatment was started 3 days prior to the first cycle of chemotherapy and continued to at least 4 cycles or completion of planned chemotherapy. All patients received institutional standard antiemetic regimens including dexamethasone and ondansetron 30 minutes prior to administration of chemotherapy. QOL was assessed using Functional Assessment of Cancer Therapy :General (FACT-G) version 4. Patients completed questionnaires at day 1 first cycle of chemotherapy; day 22; day 43 and day 64 from the date of first cycle of chemotherapy. FACT-G version 4 has been translated into Thai language with the standard procedure. 2-sided statistical analysis, with $P < 0.05$ was used to determine statistical significance.

Results: There were 40 evaluable patients in standardized 6-gingerol group and 41 evaluable patients in placebo undergoing FACT-G assessments at day 1 first cycle of chemotherapy; day 22; day 43 and day 64. After day 64, the mean difference FACT-G total score increased from baseline by 3.83 points in 6-gingerol group (P=0.169). Conversely the mean difference

FACT-G total score significantly decreased from the baseline by 4.88 points in placebo group (P<0.05). The mean difference on FACT-G total score significantly increased by 13.03 points at day 64 in standardized 6-gingerol group as compared with that of the placebo group (P<0.05).

Conclusion: Health related quality of life outcomes for patients undergoing moderately to highly emetogenic adjuvant chemotherapy could be improved following the use of standardized 6-gingerol in additional to institutional standard antiemetic regimen.

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Pharmaceutical Sciences

(Abstract)

01-PS Abstract

Analysis of hydroquinone content in skin-whitening cosmetic products: a comparison between the test kit and HPLC method

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Abstract

Analysis of hydroquinone content in skin-whitening cosmetic products: a comparison between the test kit and HPLC method

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Background: Many Thai believe that white or lighter skin color is related symbolic of beauty and health. Skin-whitening cosmetic products are very popular and prevalent all over the counter in Thailand. Development within the industry is growing continuously. Unfortunately, illegal ingredients such as mercury, retinoic acid and hydroquinone have been added to reduce costs and production time. These agents are prohibited due to their severe side effects. For customer protection purpose, hydroquinone test kit was developed. However, they occasionally produce false positives due to effects of antioxidants. Besides, current whitening agents with similar structures to hydroquinone, such as arbutin, deoxyarbutin and kojic acid, may also produce false positives.

Objective: To compare and analyze hydroquinone between HPLC method and available hydroquinone test kit (hydroquinone test kit-2 from the department of medical sciences) when testing currently-available skin-whitening products.

Method: Samples from 10 skin-whitening cosmetic products containing antioxidants and hydroquinone-like structures were taken. These samples were analyzed with hydroquinone test kits. The results were then compared to results from our newly-developed HPLC method utilizing phenol as an internal standard. The condition is C18 reverse phase column with methanol; water (20:80) as mobile phase. UV detection wavelength is 289 nm.

Result: The two methods produced the same results (100 % sensitivity and 100% specificity), indicating that the consumer hydroquinone test kit was effective and provided no false positive result with new whitening agents that have similar structure to hydroquinone. Although one sample indicated an indeterminate result when tested with the test kit, it also yielded a ghost peak near the hydroquinone peak when analyzed by the HPLC method.

Conclusion: The hydroquinone test kit can be used to detect hydroquinone in skin whitening cosmetic products with no false positive results produced from antioxidant agents and new agents with similar structure to hydroquinone.

Keywords: Hydroquinone; test kit; HPLC; skin-whitening

02-PS Abstract

Study the effects of mefenamic acid particle sizes and concentration of sodium lauryl sulfate on *in vitro* mefenamic acid released from hard gelatin capsules by 3^2 factorial design

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Abstract

Study the effects of mefenamic acid particle sizes and concentration of sodium lauryl sulfate on *in vitro* mefenamic acid released from hard gelatin capsules by 3^2 factorial design

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Background: Solubility of hydrophobic drugs is the major problem to the pharmaceutical industrial because the rate of drug absorption from gastro-intestinal tract is controlled by the rate of drug dissolved in gastro-intestinal fluids. Mefenamic acid (MA) is widely used as analgesic-antipyretic drug. MA is hydrophobic drug because the solubility of MA in water is less than 1 mg/ml. Various techniques are used for improving the solubility of drug such as chemical modification, complexation, pH adjustment, solid dispersion etc. Micellar and size reduction are traditional manufacturing methods.

Objective: The aim of the present study was to use factorial design in order to evaluate the effects of particle size of MA and concentration of sodium lauryl sulfate (SLS) on amount of MA released.

Methods:A 3^2 full factorial design was employed containing two factors at three levels and experimental trials were performed at all 9 possible combinations. The size of MA particles (X_1, sieve number 60, 120 and 170) and amount of SLS (X_2,0, 33 and 66mg) were chosen as independent variables while the cumulative percent of MA released from hard gelatin capsules after 60 minute (Q_{60min}) was selected as dependent variable. The mixtures of MA and inactive ingredients were prepared by physical mixing. The final blend was filled into hard gelatin capsules (size 0).and then their dissolution rate was evaluated. The statistical analysis of the factorial design was performed by multiple linear regression analysis using Microsoft Excel software. Analysis of variance (ANOVA) was performed to identify significant effect of factors on response.

Results: After 60 minute, drug released of all F1 – F9 formulations were 2.14%, 1.15%, 0.91%, 51.95%, 24.52%, 23.56%, 53.9%, 52.57%, 50.3%, respectively. Mathematical relationship generated using multiple linear regression analysis for the evaluated variable is expressed as follows: $Q_{60min} = 28.99 + 5.54X_1 + 25.43X_2$. The results of multiple linear regression analysis reveal that, on increasing the concentration of SLS, an increase in the Q_{60min} and increasing the size of MA particles, a decrease in the Q_{60min} was observed. From results of ANOVA, the effect of concentration of SLS (p = 0.0003) is more significant than particle size of MA (p = 0.1595)

Discussion: The amount of MA released increases with increase in concentration of SLS because of an association between MA and SLS. The size reduction limit of the conventional method is approximately 90 – 125 micron, which may not be enough to improve solubility of MA in medium.

Keywords: factorial design; *in vitro* drug released; mefenamic acid; particle size; sodium lauryl sulfate

03-PS Abstract

Preparation of Rice Straw Activated Charcoal Powder for Pharmaceutical Application

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Abstract

Preparation of Rice Straw Activated Charcoal Powder for Pharmaceutical Application

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Background: Rice straw, agricultural waste material presents negatively on the environmental impacts, which has been widely used in animal feed. The open burning of rice straw after harvesting is a considerable practice causes serious effects on the air quality. The value-added products for pharmaceutical application will be developed from agricultural waste material.

Objective: The aim of this study was to determine optimal conditions required for activated charcoal powder production from Thai rice straw with high quality for pharmaceutical application using H_3PO_4 activation process.

Method: Dok Mali 105, RD 6 and Niaw San-Pah-Tawng rice straws were selected for lignin determination. Dok Mali 105 (DM 105) contains the highest amount of lignin with 24.3 %w/w, followed by RD6 and Niaw San-Pah-Tawng, respectively. Consideration to the highest amount of lignin, DM 105 rice straw was selected to produce charcoal. Initially, DM 105 rice straw was ground and sieved to collect the particle size at 20, 40 and 60 mesh. After preparing, the rice straw material was carbonized at 200, 300, 400, 500 and 600 °C in a furnace for 1, 2, and 3 h. The pore structure of obtained charcoal was measured by scanning electron microscopy (SEM). Moreover, the adsorption property of the obtained charcoal also investigated by iodine and methylene blue adsorption.

Results: The results revealed that 60 mesh particle size carbonized at 400 °C for 2 h could affect the physicochemical properties of the obtained charcoal. The chemical activation of the obtained charcoal was then performed by refluxing method using 85% phosphoric acid as an activating agent in the ratios of 1:8, 1:10, 1:15, and 1:20 w/v for 3 h. The pore structure and adsorption properties were also investigated. It was found that the phosphoric acid activation in a ratio of 1:10 w/v was more efficient in producing activated charcoal powder because of showing the higher iodine, methylene blue, iron, zinc, lead, acetaminophen, and aflatoxin-B1 adsorption than other conditions. This condition also produces a micropore structure than other conditions.

Discussion: The adsorption capacity of rice straw activated charcoal powder on zinc, lead, and acetaminophen was higher than that of the commercial medical-grade activated charcoal according to the rice straw activated charcoal powder compose of the micropore structure. As these results, the DM105 rice straw activated charcoal powder tends to be potential for pharmaceutical and medical applications.

Keywords: Activated charcoal powder; rice straw; phosphoric acid activation

04-PS Abstract

Development of immunoassay to determine genistin in soybean products

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Abstract

Development of immunoassay to determine genistin in soybean products
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Soybean (*Glycine max* (L.) Merrill) is processed and made into many soybean products. Soybean contains many isoflavone compounds such as genistin, daidzin, malonylgenistin etc. Genistin (GT), the major compound in soybean has many pharmacological activities such as estrogenic-like effect, antioxidant etc. Nowadays, HPLC (High Performance Liquid Chromatography) method is the standard method for determination of genistin content in soybean products. In our study, we developed ELISA (Enzyme-Linked Immunosorbent Assay) method for quantitative analysis of genistin in soybean products using monoclonal (MAb) and polyclonal antibody (PAb) against genistin. In our study, the result showed that the developed ELISA for determination of GT using anti-GT PAb was in the range of 0.03-5 µg/ml. The variation of intra- and inter assay were less than 8.0%. The recoveries of GT in spiked sample were ranged from 99.70-105.33%. Whereas, the developed ELISA for determination of GT using anti-GT MAb was in the range of 0.05-5 µg/ml. The variation of intra- and inter assay were less than 7%. The recoveries of GT in spiked sample were in range of 96.89-104.20%. The developed ELISA and HPLC method showed good correlation for GT determination in samples with a coefficient of determination (r^2) of 0.9123 and 0.9916 by using anti-GT PAb and anti-GT MAb, respectively. In addition, the developed ELISA had higher sensitivity than HPLC method about 10 and 5 times by using anti-GT PAb and anti-GT MAb, respectively. Due to antibodies using for analysis could react to other structure related compounds, therefore, the developed ELISA using anti-GT MAb was applied for quantitative analysis of total isoflavone (genistin, daidzin and malonylgenistin). Whereas, the developed ELISA using anti-GT PAb was applied for quantitative analysis of total isoflavone (genistin and malonylgenistin). The developed ELISA by using MAb and PAb against genistin are the alternative method which could be used for quantitative analysis of total isoflavones in soybean products depending on type of antibody using for analysis. These developed methods have higher sensitivity than HPLC method. Moreover, ELISA methods require a small amount of organic solvent for analysis and the large sample can be analyzed at the same time.

Keywords: Genistin, soybean, ELISA, isoflavones.

05-PS Abstract

Determination of oxyresveratol in *Artocarpus lakoocha* Roxb. and products using HPLC method

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Abstract

Determination of oxyresveratol in *Artocarpus lakoocha* Roxb. and products using HPLC method

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Oxyresveratol is a major active compound in heartwood of *Artocarpus lakoocha* Roxb. It is responsible for tyrosinase inhibitor and antioxidant activity. There are many commercial products of *A. lakoocha* available in market. To evaluate the quality of raw material from the plant, we developed for quantitative analysis of oxyresveratol to evaluate the quality of *Artocarpus lakoocha.* The HPLC analysis was performed by Agilant 1100 series. The analysis was conducted on LiChroCART® RP-18, (125x4 mm, 5 µm) with 20% aqueous acetonitrile containing 0.5% acetic acid as mobile phases with isocratic system with UV wavelength 320 nm. This method displayed good linearity with R^2 = 0.9993, limits of quantity and limits of detection are 12.04 and 0.28 ng/ml, respectively. Relative standard deviation values for intra- and inter-day precision were <1.0% and <1.83%, respectively. The recovery of oxyresveratol in spiked samples were in the range from 99.61-115.27%. The results showed that puag-haad contains the highest level of oxyresveratol (498.34±8.15 µg/mg dry weight.) followed by heartwood of *A. lakoocha* (23.0±1.26 µg/mg dry weight.). The products derived from *A. lakoocha* contain oxyresveratol in the range of 0.96 to 31.06 µg/mg fresh weight. Therefore, the developed method can be applied for determination of oxyresveratol in *A. lakoocha* and products.

Keywords: oxyresveratol; HPLC; *Artocarpus lakoocha*

06-PS Abstract

Determination of moscatilin and gigantol contents and antioxidant activity in selected *Dendrobium* spp. in Thailand

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Abstract

Determination of moscatilin and gigantol contents and antioxidant activity in selected *Dendrobium* spp. in Thailand

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Introduction: *Dendrobium* spp. (Orchidaceae family) are widely distributed in Asian countries. The fresh or dried stems of *Dendrobium* spp. have long been used in traditional Chinese medicine for tonic and antipyretic. Bibenzyl derivatives are the major active compounds in stem of *Dendrobium* spp. Among them, moscatilin and gigantol are used as chemical maker in *Dendrobium* spp. Many *Dendrobium* spp. have been recorded in Thailand; however, moscatilin and gigantol contents and antioxidant activity have not yet been reported. **Methods:** Therefore, selected of *Dendrobium* spp. (24 species) dried stems in Thailand were extracted and analyzed by using HPLC and DPPH assay. The HPLC method was performed on a reverse phase column (LiChorCart®, 125 mm x 4 mm, 5 µm particle size); a mobile phase system consisted of 30% acetronitrile and 1.5% acetic acid with flow rate at 0.8 ml/min; and detection at wavelength of 280 nm. **Results:** The HPLC method displayed good linearity with a coefficient of determination (r^2) of 0.9994 for moscatilin and gigantol analysis. The limit of quantification (LOQ) and limit of detection (LOD) ranges were 2.47 - 0.74 µg/ml for moscatilin and 2.85 - 0.85 µg/ml for gigantol, respectively. The precision of for intra- and inter-assay (%RSD) were less than 5.0%. The recovery of total bibenzyl content in spiked *D. primulinum* samples were in the range from 92.67-111.64%. Each sample was performed with three replicated. Our results showed that total bibenzyl contents (moscatilin and gigantol) and antioxidant activity in 17 species of *Dendrobium* were different. Among them, *Dendrobium venustum* contained the highest bibenzyl content (8.96 ± 0.36 mg/g dry wt.). The antioxidant activity showed the IC_{50} of *Dendrobium* spp. stem extracted in the range of 250 – 9,200 µg/ml. *Dendrobium fimbriatum* showed strongest antioxidant activity(IC_{50} = 250±10 µg/ml). IC_{50} of moscatilin and gigantol were 23.23±1.21 and 10.75±0.16 µg/ml, respectively. **Conclusion:** The developed HPLC method can be used for determination of moscatilin and gigantol contents in selected *Dendrobium* spp. *Dendrobium* spp. which contained high level of these compounds as well as antioxidant activity will be useful for further study.

Keywords: *Dendrobium* spp.; HPLC; DPPH assay; antioxidant activity; moscatilin; gigantol

07-PS Abstract

Imbalance of antioxidant enzyme, superoxide dismutase, and hepatopathology in mice induced by *Plumbago indica* L.

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Abstract

Imbalance of antioxidant enzyme, superoxide dismutase, and hepatopathology in mice induced by *Plumbago indica* L

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Introduction: *Plumbago indica* L. or scarlet leadwort has long been used in Thai traditional medicine for treatments of diarrhea, skin diseases, anthelmintics, and for appetite stimulation and abortion. **Objective:** In this study, the effect of *P. indica* on hepatic superoxide dismutase (SOD) activity and histomorphology were examined in order to assess their hepatotoxicity potential. **Method:** The 7-week-old male ICR mice were intragastrically treated with 0.5% carboxymethylcellulose (CMC) as control group and treated with 20, 200, and 1,000 mg/kg/day of *P. indica* methanolic crude extract (PI) for 14 days. At 24 h after the last treatment, the mice were sacrificed and collected the livers for assessment of SOD activity and histological morphology. **Results:** SOD activity of the PI-treated mice was significantly decreased when compared to the non-treated mice. Though, the lowest dose of PI did not exhibit hepatic histo-morphological change; at higher doses shown the evidence of histo-pathological feature as observing of nuclear shrinkage and intracellular edema. **Conclusion:** The results suggested that *P. indica* possibly induced hepatotoxicity due to imbalance of anti-oxidative system via suppression of the SOD antioxidant enzyme. Hence, high dose or long term consumption of *P. indica-based* product is of caution and concern.

Keywords: *Plumbago indica*, superoxide dismutase, histo-morphology, hepatotoxicity

08-PS Abstract

Antioxidative property of tetrahydrocurcumin in high fat and high fructose diet induced lipid peroxidation in mice.

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Abstract

Antioxidative property of tetrahydrocurcumin in high fat and high fructose diet induced lipid peroxidation in mice.
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Background: Nowadays, several of convenient store-food and beverage contain high amount of fat and fructose. Excessive consumption of fat and fructose is one of the implicated metabolic risk factors such as non-alcoholic fatty liver disease. The progression of the disease related to liver damage through oxidative stress.

Objective: The study aimed to investigate the effect of tetrahydrocurcumin (THC) on hepatic lipid peroxidation profile in the high fat and high fructose diet-fed mice.

Methods: 8-Week of age male ICR mice were separated into 2 main groups includes the high fat and high fructose diet (HFD) group, which were daily intragastrically given hydrogenated soy bean oil (1 mL/day) and 20% fructose solution, and the regular diet (RD) group as the control group, which were *ad libitum* feeding of standard chaw and drinking water continuously for 8 weeks. Along with HFD treatment, the mice were divided into 5 groups and received of 0.5% CMC (0.1 mL/day) used as the vehicle and a mixture of vitamin E (VitE, 100 mg/kg/day) or THC (50, 100, or 200 mg/kg/day) prepared in the vehicle. The lipid peroxidation was assessed employing thiobarbituric acid reactive substances (TBARS) content and serum aspartate transaminase/alanine transaminase (AST/ALT) ratio in the livers as the diagnostic marker.

Results: RD-fed mice showed the serum AST/ALT ratio < 1 which indicated a normal liver function. In contrast, the higher AST/ALT ratio and a dramatically increase of TBARS level in the HFD fed-mice was observed in comparison to RD mice. Interestingly, the AST/ALT ratio and the level of TBARS were significantly lower when treated with either THC or VitE along with high fat and high fructose diet.

Conclusion and Discussion: These findings revealed that continuous excessive consuming diet containing high fat and high fructose for a long period trends to affect the liver morphology and induce oxidative stress. THC presented beneficial effect as an antioxidant as similar to VitE. Promisingly, THC is a high potential compound to be promoted as an alternative hepato-protective agent via prevention of oxidative stress induced by excessive food dense in calories with high fat and/or fructose consumption.

Keywords: aspartate transaminase, alanine transaminase, high fat and high fructose diet, histomorphology, thiobarbituric acid reactive substances, tetrahydrocurcumin.

09-PS Abstract

Impact of *Garcinia mangostana* pericarp crude extract and alpha-mangostin on methicillin-resistant *Staphylococcus aureus* superficial infection in the tape stripping mouse model

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Abstract

Impact of *Garcinia mangostana* pericarp crude extract and alpha-mangostin on methicillin-resistant *Staphylococcus aureus* superficial infection in the tape stripping mouse model

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Background: *Garcinia mangostana* Linn. (GM) or mangosteen is a tropical fruit in South-East Asia which has been traditionally used for a long time due to its pharmaceutical activities.

Objective: The present study aimed to determine the antibacterial effects of GM pericarp crude extract and alpha-mangostin on tape-stripping induced methicillin-resistant *Staphylococcus aureus* (MRSA DMST_20651) superficial infection in mice. Adult ICR male mice (7-week-old) were induced superficial wound by tape stripping technique, followed by MRSA inoculation. Mice were divided into five groups, namely control (non-infected mice), non-treated (MRSA infected-mice with no treatment, NT), base (MRSA infected-mice treated with 10% ethanol in propylene glycol), GM (MRSA infected-mice treated with 10% GM in the base), and alpha-mangostin (MRSA infected-mice treated with 1.32% alpha-mangostin in the base). Transepidermal water loss (TEWL) was measured to indicate barrier function of the skin.

Result: After performing the tape stripping, TEWL increased to 76.56±1.62 g/m^{2}h. The TEWL of GM group was declined (64.01±8.44 g/m^{2}h) and significantly different (p<0.001) from the NT group on the 4th day while the TEWL of alpha-mangostin group was persistent (75.55±14.29 g/m^{2}h). The wound was swabbed to culture MRSA on the oxacillin-added mannitol salt agar. The numbers of MRSA colony of the GM group were declined and comparable to the control group since the first day of treatment. On the 3rd day, the numbers of MRSA colony of the alpha-mangostin group was significantly recovered to nearly the same level as the control group while those of NT was persistently high and significantly different from the control (p<0.001).

Conclusion: GM conveyed the greater competency to reduce the numbers of MRSA and promote wound healing in the superficial infection in mice compared to alpha-mangostin. Therefore, GM is a promising antibacterial candidate for further developing as an alternative topical formulation against the MRSA superficial infection.

Keywords: *Garcinia mangostana*; alpha-manogstin; methicillin-resistant *Staphylococcus aureus*

10-PS Abstract

Standard anti-tuberculosis regimen modulates antioxidant enzymes, catalase and superoxide dismutase, in mouse kidneys

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Abstract

Standard anti-tuberculosis regimen modulates antioxidant enzymes, catalase and superoxide dismutase, in mouse kidneys

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Background: Tuberculosis is an infectious disease caused by *Mycobacterium tuberculosis.* The standard anti-tuberculosis regimen recommended by WHO 2010 is the combination of isoniazid (H, 5 mg/kg/day), rifampicin (R, 10 mg/kg/day), pyrazinamide (Z, 25 mg/kg/day), and ethambutol (E, 15 mg/kg/day), in which HRZE 2 months for the intensive phase and HR 4 months for the continual phase. There are evidences supported that long term use of the standard treatment disturbed the enzymatic antioxidant system, resulted in protein-oxidation, inhibition of enzymes, DNA damage, lipid peroxidation, and finally cell necrosis, which subsequently caused many adverse effects.

Objective: The study aimed to evaluate the effect of standard anti-tuberculosis regimen on activity of antioxidant enzymes including catalase (CAT) and superoxide dismutase (SOD) in the mouse kidneys.

Methods: Male ICR mice at 7 weeks of age were orally administered at 5 or 10 times of the standard anti-tuberculosis regimen consecutively for 7 and 14 days, respectively. The control was daily given the vehicle, 0.5% carboxymethylcellulose (CMC), for the same periods. The CAT and SOD activities were accessed in the mouse kidneys.

Results: Both of the 5 and 10 times of the standard anti-tuberculosis regimens significantly reduced CAT activity in the mouse kidneys while SOD activity was declined only by the 5 times dosage regimen for either 7 or 14 days-treatment.

Conclusion: The standard anti-tuberculosis regimen demonstrated interference to the redox balance in the mouse kidneys via reduction of the CAT and SOD activities in the dose- and time-dependent manners.

Keywords : catalase; enzymatic antioxidant system; standard anti-tuberculosis regimen; superoxide dismutase; tuberculosis

11-PS Abstract

Growth promoting of *Lactobacillus delbrueckii* subsp. Lactis and inhibition of *Escherichia coli* by purple rice bran extracts

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Abstract

Growth promoting of *Lactobacillus delbrueckii* subsp. Lactis and inhibition of *Escherichia coli* by purple rice bran extracts

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Background: Rice bran is an agriculture by-product; a rich source of nutrition and health functional ingredients, which nowadays has been widely incorporated in various kinds of supplementary food products in respected to its pharmacological reports of antioxidation, antiinflammation, immunomodulation and others. However, the effect in growth of intestinal bacteria, which is important system for health homeostasis and chronic disease development, is limited.

Objective: The aim of this study was to determine the effects of rice bran extract on *Escherichia coli* (*E.coli*) and *Lactobacillus delbrueckii* subsp. Lactis (LAB) which represent pathogen and good intestinal bacteria, respectively.

Methods: Purple rice bran extracts were prepared by using two different methods: mixed culture fermentation (H7) and 50% ethanolic extraction (H7_EtOH) and followed with liophilization. Using broth dilution method accompanied with *flow cytometry technique*, at various concentrations, the effects on *E.coli* and LAB growth of H7 and H7_EtOH were independently investigated to obtain the minimal inhibitory concentration (MIC) and minimal bactericidal concentration (MBC) values of each sample. Moreover, bacterial morphology at MIC and MBC tested mixture were observed after gram staining.

Results: The different anti-microbial effects of H7 and H7_EtOH were demonstrated. Both H7_EtOH and H7 extract showed inhibitory effect to *E.coli* and LAB growth at MIC value of 3.125 mg/mL. However, only H7_EtOH that could kill the LAB at MBC value of 100 mg/mL and resulted in morphological change of the treated LAB. In contrast, H7 exhibited LAB growth promoting effects at high concentrations range between 25 to 100 mg/mL.

Conclusion: The potential of the purple rice bran extracts in modulation of intestinal bacteria; promoting LAB growth of H7 and inhibiting *E.coli* growth of both H7 and H7_EtOH, was demonstrated which could imply the applications of them in health promotion and homeostasis.

Keywords: Rice bran extracts; Lactic acid bacteria; *Escherichia coli*; Intestinal bacteria

12-PS Abstract

Inhibitory effects against amylase and lipase enzyme of selected Thai local crops

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Abstract

Inhibitory effects against amylase and lipase enzyme of selected Thai local crops
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Background: Using of natural materials as local vegetables, spices, and fruits for overweight and obesity treatment has been interesting or has gained interest among the consumers due to the advantages of easy accessibility, safety, low cost, and wide spectrum of health benefits thereof.

Objective: The aim of this study was to screen the effect of ethanolic extracts of purple rice bran (*Oryza sativa*), Mao-Luang (*Antidesma bunius*), and banana blossom (*Musa* spp.) on activity of lipase and α-amylase enzyme.

Methods: Using *in vitro* model, the screening of inhibitory effect of samples to lipase activity was done using p-nitrophenyl butyrate as a color substrate, while, the inhibitory effect to α-amylase activity was conducted using 3,5-dinitrosalicylic acid as the color forming reagent with reducing sugar.

Results: The results showed that the different lipase activity inhibition at equal concentration 750 µg/mL of Mao-Luang, purple rice bran and banana blossom ethanolic extracts was found and expressed in different amount equivalences to orlistat, the standard lipase inhibitor, as of 4.42 ± 0.55, 4.09 ± 0.27 and 2.60 ± 0.72 mg orlistat equivalence/g extract, respectively. Both purple rice bran and Mao-Luang extracts had significantly higher potencies than that of banana blossom. For α-amylase inhibitory effects, the amount equivalences to acarbose, the standard α-amylase inhibitor, at concentration 125 µg/mL of purple rice bran, banana blossom, and Mao-Luang ethanolic extracts were 198.90 ± 6.11, 152.61 ± 5.40 and 149.52 ± 22.79 mg acarbose equivalence/g extract, respectively. However, there was non-significantly among them.

Conclusion: This finding has evidence on the anti-obesity potential of the purple rice bran, Mao-Luang and banana blossom ethanolic extracts. Further in-depth study to facilitate the research and development of health products and applications in obesity and over-weight prevention and treatment are promising to carry on.

Keywords: anti-lipase; anti-amylase; purple rice bran; Mao-Luang fruits; banana blossom

13-PS Abstract

Tube formation in culture media containing rice bran oil with different concentrations of gamma oryzanol

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Abstract

Tube formation in culture media containing rice bran oil with different concentrations of gamma oryzanol

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Background: Rice bran oil (RBO) consumption has been reported for a benefit for the plasma total cholesterol and low-density lipoprotein (LDL) in healthy subjects. Gamma-oryzanol (GO) is a unique mixture of triterpene alcohol and sterol ferulates present in rice bran oil with a hypocholesterolemic activity.

Objective: The aim of this *in vitro* study was to examine the antiangiogenic effect of RBO containing different concentration of GO.

Method ; Human umbilical vein endothelial cell (HUVEC) was cultured for tube formation assay in culture media containing 0, 10, 50 and 100 μg/ml RBO with different concentration of GO, 5,000, 8,000, 15,000 and 18,000 ppm.

Results: IC_{50} for tube formation inhibition was lower with higher GO concentration. RBO containing gamma-oryzanol 15,000 and 18,000 ppm showed IC_{50} at 41.2 $\pm$ 5.4 and 27.6 $\pm$ 1.4 μg/ml, respectively.

Discussion: Our findings showed the efficiency of RBO for higher antiangiogenic activity with RBO containing higher concentration of GO. Further study of the cellular mechanism is worthwhile.

Keywords: rice bran oil, angiogenesis, tube formation assay

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Pharmacy Education

(Full Paper)

01-PE Original Article

Effect of oral discussion on drug dispensing skills and attitudes of pharmacy students

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Abstract

Effect of oral discussion on drug dispensing skills and attitudes of pharmacy students

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Introduction: Oral discussion is one of the active learning techniques to encourage pharmacy students counseling and communication skills. Students are also able to share their knowledge and opinions with preceptors and colleagues. The objective of this study was to evaluate the effect of oral discussion on drug dispensing skills and attitudes of pharmacy students compared to the written case study exercise in the course of Pharmacy Professional Practice Clerkship III (Osotsala Session).

Materials and Method: Eighty-four undergraduate students in the fourth year who enrolled the course in the academic year of 2015 were assigned oral discussions as the experimental group. Sixty-seven students who enrolled the same course in the academic year of 2014 were assigned written case study exercises as the control group. A pre-test was given to all students before the clinical clerkship. Drug dispensing skills were scored by preceptor observation dividing into 2 dimensions; counseling service and knowledge. Students' self-evaluation and attitudes were assessed by a questionnaire at the end of the course. Data were analyzed by ANCOVA and independent *t*-test.

Results: Average scores of drug dispensing skills of the experimental and control groups were not significantly different (43.51±2.61 and 42.95±3.57 respectively, p=0.194). For self-evaluation and attitudes towards the course, students in the experimental group had significantly higher score than students in the control group in the aspects of communication skills, medical history taking skills, considering drug selection in gastrointestinal tract and skin diseases, and patient referral consideration (p=0.005, 0.007, 0.047, 0.004, and 0.003, respectively). There was no statistically significant difference in the satisfaction on the learning technique between two groups (3.90±0.86 and 3.64±0.93 respectively, p=0.074).

Conclusion: Oral discussion may not significantly influence on pharmacy students' drug dispensing skills but can positively increase their attitudes scores towards the clerkship course, compared to the written case study exercise. The students' attitudes may be affected by the student-preceptors and student-colleagues interactions during oral discussion which further used for the development of pharmacy professional practice.

Keywords: discussion; drug dispensing; attitude; pharmacy student; pharmacy education

Introduction

Drug dispensing skills are the most important skills for pharmacists. Good drug dispensing practice requires well-organized medical history taking skills to obtain the sufficient data for appropriate drug selection, specific patient counseling and education together with reliable personality of the pharmacists (The Pharmacy Council of Thailand, 2011). The Pharmacy Professional Practice (PPP) Clerkship III (Osotsala Session) provides the fourth year pharmacy students with a 22.5-hour experience in community pharmacy practice under instruction and supervision by preceptors (Office of Professional Experience Programme, 2014). In the academic year 2014, the students were assigned written case study exercises provided by preceptors during the clinical clerkship. Although the written case studies simulated the situation of common community care setting, the students required the practice in verbal communication and instant decision making skills to enhance drug dispensing skills. Therefore, in the academic year 2015, the oral discussions were included in the clerkship activities instead of the written case study exercises to improve their achievement. The drug dispensing skills and attitudes of pharmacy students were evaluated.

Materials and Method

A clerkship orientation and a pre-test were provided to all students at the beginning of the course. The community pharmacy practice clerkship consisted of a 22.5-hour experience in Osotsala drugstore. In the experimental group, oral discussions about the cases counseling on the clerkship period were created for 15 min in every practice sessions at the practice site. During oral discussion, preceptors had the responsibility to encourage the students to describe the case characteristics, explain their reasons supporting the medicinal selection, and discuss with their colleagues. The preceptors then provided constructive feedbacks to the students at the end of the discussion periods. In the control group, the written case study exercises were assigned to the students for 15 min in every practice sessions. The written feedbacks were provided by preceptors. The evaluation focused on the student developing their dispensing skills using the competency standards as a framework. These included speaking clearly, using appropriate terminology, asking open-ended questions, prioritizing counseling points, listening to patients, verifying patient understanding, and displaying a caring attitude. Drug dispensing skills were divided into 2 dimensions; counseling service and knowledge, which were evaluated using scoring rubric with content validity. Students' self-evaluation and attitudes towards the course were assessed by a questionnaire at the end of the course.

Data were expressed as mean ± standard deviation. The statistical significances between 2 groups were determined by analysis of covariance (ANCOVA) and independent *t*-test with $p<0.05$.

Table 1 Evaluation scores of drug dispensing skills[1]

	Oral discussion group [N=84]	**Written case study group [N=67]**	**P-value[2]**
Drug dispensing skills	43.51 ± 2.61 [36.92, 48.70]	42.95 ± 3.57 [35.73, 50.00]	0.194
- counseling service	32.56 ± 1.85 [27.71, 36.08]	31.76 ± 2.70 [27.00, 37.00]	0.055
- knowledge in drug dispensing	10.95 ± 1.03 [7.55, 12.97]	11.19 ± 1.08 [7.90, 13.00]	0.716

[1]Data expressed as mean±SD [min, max]

[2]ANCOVA test defined the learning pattern as an independent variable and a pre-test score as a covariate parameter

Results

Overall 151 of the fourth year students were included into the study; 84 in the experimental group and 67 in the control group. Average age was 21.85±0.77 years old. Gender distribution and grade point average (GPA) of the students were not significantly different between 2 groups (p=0.450 and 0.808 respectively). Average scores of drug dispensing skills of the experimental and control groups were not significantly different (43.51±2.61 and 42.95±3.57 respectively, p=0.194, from overall 50 points) in both counseling service and knowledge dimensions (p=0.055 and 0.716 respectively) (Table 1). It can be noticed that the experimental group had slightly higher scores in counseling service than the control group. This result was consistent with previous studies which showed the effective of oral presentation and instant feedback on communication skills of pharmacy students (Gonyeau, 2006; McDonough, 2006). Both verbal and non-verbal communication skills were necessary in advanced pharmacy practice experience (McDonough, 2006).

Table 2 Self-evaluation and attitudes scored by students after the clinical clerkship

Evaluation items	**Oral discussion group [N=84]**	**Written case study group [N=67]**	***p*-value**[1]
Self-evaluation score after the clinical clerkship			
1) communication skills	4.25 ± 0.64	3.91 ± 0.81	0.005
2) medical history taking skills	4.10 ± 0.53	3.82 ± 0.69	0.007
3) considering drug dispensation in common diseases			
- respiratory tract diseases	3.98 ± 0.69	3.82 ± 0.69	0.174
- gastrointestinal tract diseases	3.94 ± 0.63	3.70 ± 0.80	0.047
- musculoskeletal diseases	3.74 ± 0.73	3.64 ± 0.83	0.450
- skin diseases	3.87 ± 0.71	3.46 ± 0.94	0.004
4) advice on over-the-counter products	3.46 ± 0.84	3.21 ± 1.07	0.102
5) prescription labeling and pill counting skills	3.88 ± 0.80	3.99 ± 0.69	0.398
6) counseling skills	4.13 ± 0.58	3.93 ± 0.80	0.069
7) advice on special technique products	3.68 ± 0.85	3.52 ± 0.96	0.292
8) patient referral consideration	3.52 ± 0.77	3.04 ± 1.12	0.003
Attitudes towards the course	57.95 ± 7.32	54.28 ± 9.12	0.007
Satisfaction scores	3.90 ± 0.86	3.64 ± 0.93	0.074

[1]Independent *t*-test

After the clinical clerkship, students in the experimental group significantly marked themselves higher score than students in the control group in the aspects of communication skills, medical history taking skills, considering drug selection in gastrointestinal tract and skin diseases, and patient referral consideration (p=0.005, 0.007, 0.047, 0.004, and 0.003 respectively) (Table 2). For attitude, students doing oral discussion had relatively positive to the clerkship course than students doing written case study exercise (57.95±7.32 and 54.28±9.12 respectively, p=0.007 from overall 75.00 points). Average satisfaction scores on the learning technique of the experimental and control group were in moderate level with no statistically significant difference. A previous study reported 45.4% of the fourth year pharmacy students concerned that drug dispensing skills were important to the community pharmacy practice and the preceptors were mainly involved in the student encouragement (El-Sakran, 2006). An effective instruction, student-preceptors and student-colleagues relationships affected students' performance and attitude on the clerkship course (McDonough, 2006). The feedback from a preceptor or a coworker during oral discussion should be constructive and educational to improve the students' skills.

Conclusion

Oral discussion may not significantly influence on pharmacy students' drug dispensing skills but can positively increase their attitudes scores towards the clerkship course, compared to the written case study exercise. The students' attitudes may be affected by the student-preceptors and student-colleagues interactions during the oral discussion which further used for the development of pharmacy professional practice.

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02-PE Original Article

Discussion-based Learning in Pharmacology III Course of Pharmacy Students

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Abstract

Discussion-based Learning in Pharmacology III Course of Pharmacy Students
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Introduction: The learning objectives of Pharmacology III course is to develop essential academic skills for pharmacy students including academic literature searching, evaluation and summarization the pharmacology of new drug. In this course, students were divided into group of 4 or 5 persons and each group was assigned to study one new drug under supervised by an instructor. Due to a high number of students, each group of students was allowed to meet their supervisor for 40 minutes per week. Students had to study, search literatures, evaluate and summarize scientific articles, then write a group report by themselves as self learning. From the previous class, students developed less essential academic skills than were expected by the course objectives. The purpose of this study was to compare between self learning and discussion-based learning in terms of students' opinions about discussion-based learning and quality of the reports.

Materials and Method: This was an experimental study with cross-over design. Four groups of students (n=17) were randomized to do either self learning in preclinical study part then discussion-based learning in clinical study part or discussion-based learning in preclinical study part then self learning in clinical study part. A questionnaire with 5-point Likert scale and a scoring rubric were used to assess students' opinion and quality of the reports, respectively.

Results: Students' opinion in discussion-based learning demonstrated that this learning method helped them to improve their understanding of scientific articles, promote their critical thinking and integrate basic knowledge to understand drug research and development process. Discussion-based learning also minimized working process leading to finish their work in a certain time. Moreover, discussion-based learning enhanced student-instructor relationship. In addition, the quality of reports from discussion-based learning part higher than the quality of report from self learning part in certain areas including academic accuracy, completeness, sequencing and consistency and figure illustration but these were not significantly different.

Conclusion: The discussion-based learning method helped student improve essential academic skills in certain areas and also gain high satisfaction in Pharmacology III course according to students' opinion. Further study should be conducted to improve the results, for example add more discussion opportunity using online web course or increase more discussion time.

Keywords: discussion-based learning; pharmacology; pharmacy students

Introduction

Pharmacology III is a required course for the fourth year students in the doctor of pharmacy programs. The objective of this course is to advance essential academic skills for pharmacy students including academic literature searching, evaluation and summarization the pharmacology of new drugs. Students will develop the systematic analytical skills to integrate their basic knowledge including physiology, biochemistry, pathophysiology, pharmaceutical chemistry and pharmacology to understand drug research and development process. After finishing this course, students will be able to write an academic report and the pharmaceutical leaflet for healthcare professionals and also offer the oral presentation.

In Pharmacology III course, students were grouped into 4 or 5 persons and studied the information of an assigned new drug under the instructor's supervision (4 groups per an instructor). Each group of students was allowed to meet their supervisor for 40 minutes per week to ask questions and gain suggestion about their drafted version of the report. Students then had to review more related information, summarized and write the group report on their own. By means of this "self learning" method, the instructor could not encourage students to develop their critical thinking as students had to do self learning without adequate supervision. This self learning method resulted in low quality learning outcomes as observed students' opinions and quality of reports from the previous class. Therefore, in this research, discussion-based learning has been substituted as a solution. This technique is based primarily on group work that supports students to develop critical skills consisting of teamwork, information sharing and discussion skill (Wood, 2013). In this method, the instructor is a key facilitator who guides students in their works for appropriate literature searching, and enhancing strategic inquiry (Hmelo-Silver and Eberbach, 2012). Moreover, increased an opportunity to discussion and practiced presentation with their classmate and instructor might improve the quality of learning as well as academic achievement.

This research aimed to compare between self learning and discussion-based learning in terms of students' opinion about discussion-based learning and quality of the reports.

Materials and Method

This was an experimental study with cross-over design. Seventeen students participating in this study were the fourth year students in the Faculty of Pharmaceutical Sciences, Chulalongkorn University. These students were from two majors: pharmaceutical sciences (n=8) and pharmaceutical care (n=9). The report topics used in this study included the preclinical study and clinical study parts. The contents in the preclinical study part were the research of a new drug *in vitro* and *in vivo* to understand its mechanisms of action while the contents in the clinical study part were the studies of a new drug in human to show its efficacy and safety. Both parts needed student's skills in academic literature searching, evaluation, background knowledge integration and summarization. As students from two majors were only slightly different in their background knowledge and experiences, the skills needed for those topics were thus considerably equivalent. Four groups of students randomly received either self learning in preclinical study part then discussion-based learning in clinical study part or discussion-based learning in preclinical study part then self learning in clinical study part (Table 1).

In the self learning period, each group of students was allowed to meet the instructor for 40 minutes per week to ask questions then they had to read articles and write the report on their own. In the discussion-based learning period, two groups of students were in the discussion room for 80 minutes and discussed in various topics for example pathophysiology of the disease, pharmacology of the assigned new drugs, experimental designs, methods and the interpretation of the results in the selected articles. The instructor facilitated the class by encouraging students to integrate their basic knowledge to understand the scientific articles, compare their information and point out the advantages and disadvantages of different study designs. The instructor also guided students to evaluate and summarize the information to write the report.

Students' opinion about discussion-based learning was evaluated using a Likert scale in which the score ranged between 0 (strongly disagree) to 4 (strongly agree). Quality of the reports were assessed using scoring rubric which comprised of the six sub-topics including academic accuracy, completeness, sequencing and consistency, quality of figure, report's neatness, and language usage. Each topic was evaluated by two independent instructors who were blinded to the student's groups in order to reduce bias. Students' opinion and quality of report scores were expressed as mean±S.D. Both self and discussion-based learning report scores were compared using student's paired t-test. The difference between the two learning methods were considered to be statistically significant at a p value lesser than 0.05.

Table 1 Study design

study topic / student group	Preclinical study part	Clinical study part
Pharmaceutical sciences group 1	discussion-based learning	self learning
Pharmaceutical sciences group 2	self learning	discussion-based learning
Pharmaceutical care group 1	discussion-based learning	self learning
Pharmaceutical care group 2	self learning	discussion-based learning

Results

Students' opinions on discussion-based learning were shown in Table 2. The results demonstrated that most students satisfied with discussion-based learning which supported them to understand scientific articles (Question 2). In addition, this learning method could help them to improve critical thinking (Question 4) and integrate their background knowledge to understand drug research and development process (Question 6). It also minimized the working process (Question 9), and promoted students to select the appropriate scientific articles (Question 1). Besides the understanding of the report contents, students also found that this learning process allowed them to participate in more activities while the self learning did not (Question 3&8). This helped students to finish their works by a certain time (Question 10). It also enhanced instructor-student relationship as students can ask questions or debate with their classmates and instructor openly (Question 12). In the same way, the instructor was able to offer appropriate solutions regarding the problems which students encountered in their work (Question 13). Taking into consideration, this solution meets and achieves the objectives of learning. However, most students pointed out that learning by discussion still did not yet motivated them to raise more questions. This may be caused from the opportunity to meet instructor and they think they can get answer or guidance from instructor.

In term of the quality of report, it was shown that the summarized report scores from all the discussion-based learning groups ware higher than the summarized report scores from all self learning groups, particularly in academic accuracy, completeness, sequencing and consistency, and figure illustration but these were not statistically significantly different (Figure 1). However, the discussion-based learning groups obtained higher overall report scores than the self learning groups (Figure 2).

Table 2 Students' opinion about the discussion-based learning (n=17).

	Questions	mean± S.D.
1.	(Discussion-based learning) helps me to select the appropriate scientific articles.	3.353 ± 0.931
2.	(Discussion-based learning) helps me to understand the scientific articles.	3.294 ± 0.92
3.	(Discussion-based learning) helps me to understand the report contents.	3.588 ± 0.618
4.	(Discussion-based learning) helps me to improve my critical thinking.	3.059 ± 1.029
5.	(Discussion-based learning) encourages me to raise the questions and to search for additional information.	2.882 ± 0.928
6.	(Discussion-based learning) helps me to integrate the basic knowledge to understand drug research and development process.	3.235 ± 0.752
7.	(Discussion-based learning) helps me to organize their report contents.	3.412 ± 0.87
8.	(Discussion-based learning) encourages me to participate in the activities.	3.235 ± 1.091
9.	(Discussion-based learning) helps minimizing the working process.	3.471 ± 0.874
10.	(Discussion-based learning) helps me to finish my work by a certain time.	3.235 ± 0.831
11.	(Discussion-based learning) helps me to manage my time.	1.706 ± 1.359
12.	(Discussion-based learning) enhances instructor-student relationship.	3.588 ± 0.618
13.	(Discussion-based learning) leads the instructor to offer appropriate solutions regarding the problems which I encounter in my work.	3.765 ± 0.562

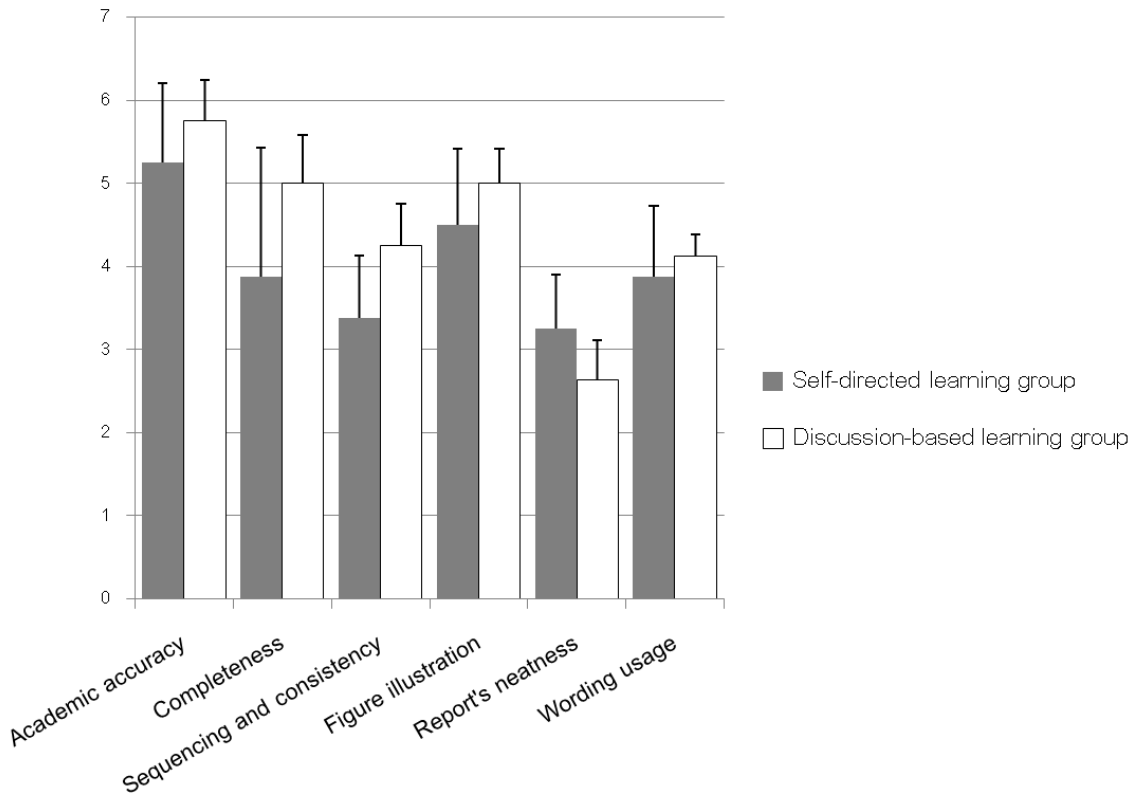

Figure 1 Compare summarized report scores between two learning methods in each detail aspects.

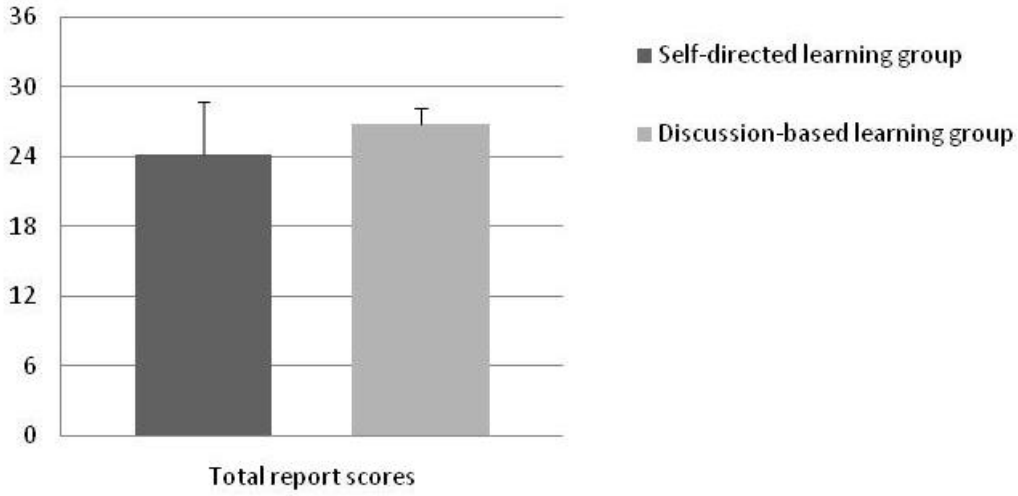

Figure 2 Compare the summarized report scores between self learning groups and discussion-based learning groups.

Discussion and conclusion:

From this study, we found that the discussion-based learning method provide a better learning progression and satisfaction as it can help students to improve their academic skills understanding the scientific articles, promote the critical thinking and integrate the basic knowledge to understand drug research and development process. The increase of report scores during the discussion-based part can reflect a good improvement of students. Nevertheless, the discussion-based learning did not encourage students to generate the new questions and search for additional information (Question 5). The course content and evaluation should be revised to help students understand the new knowledge and the application in pharmacy practice to promote the lifelong learning (Lee and Kwan, 1997; Wood, 2013). To enhance further discussion, using of the online classroom can support students to discuss their problems or ask questions about the research articles. Moreover, students could send the articles and relevant questions via the online channel before the discussion hours. This allows the instructors to have enough time for information preparation so that it can diminish the time spent during the discussion hours.

In the future, the learning method in Pharmacology III course should be revised and changed into the discussion-based learning. However, this research was conducted only in Pharmacology III course which is a project oriented learning course. These results might not be applied to other subjects or courses. For the improvement of the learning method, other factors related to the learning outcome should be elucidated and further experiments about these factors should be studied.

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Pharmacy Education

(Abstract)

03-PE Abstract

Learning integration: becoming a pharmacist

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Abstract

Learning integration: becoming a pharmacist
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The objective of this study was to develop teaching method for first year pharmacy students to enhance their knowledge, broader their vision, understand social context, and shape their attitude in linking professional practice to serve the communities. The methodology was integration of 2 courses; Learning through activities I (course code: 462100) and Pharmacy orientation (course code: 462151), a total of 143 students. Multi-skill was combined to enhance learning process; reading, listening, writing, questioning, Video making, presentation, team working, and discussion skills. Students were divided into 9 groups, 14-17 students with one assigned advisor in each group. The study period was during the 1st semester of 2015 academic year. Four learning activities was conducted; 1) reading a book entitled “The Truth About the Drug Companies: how they deceive us and what to do about it.” in Thai version. The students summarized and conducted their opinions towards some points of the book then participated group discussion with their friends and advisor. 2) each group managed to send their members to meet and discuss with 23 invited pharmacists from various settings, then discussed and summarized the data within group. 3) creating a Video clip entitled “I’m Pharmacist” from their information. 4) presentation their Video clips and employed discussion. Evaluation was conducted by the open-end questionnaire and class discussion.

Results demonstrated that the learning integration enhanced students to develop their content skills; students understood drug development process and the conditions that affected to drug development and drug utilization within society such as patent, law, business competition including professional code of ethics. Discussion with their peers and lecturers allowed them to understand these complicated factors and conditions deeper. Moreover, learning activities helped them to develop their learning skills such as reading, listening, writing, questioning, Video making, presentation, team working, and discussion skills. They learned how to present their opinions as well as to listen to others especially the different point of view.

In conclusion; students developed multi-learning skills and learned how to build the linkage between what they have learned and the role of a professional pharmacist.

Keywords: learning skill, pharmacy education, pharmacist, learning activities

04-PE Abstract

The using free game based learning websites in Pharmacy course: the development for future trends of 21st Century of Pharmacy study

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Abstract

The using free game based learning websites in Pharmacy course: the development for future trends of 21st Century of Pharmacy study

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Background: During the major changes in education process to serve the trends of 21st century students make educators need to develop the new strategy to persuade the students' participation.

Objective: To implement free game based learning website in Pharmacy Course and observed the outcome in the class.

Methods: Free game based learning website (getkahoot.com) was used in Pharmacy course (drug excretion topic) for teaching fourth-year pharmacy students. This activity was started after finished lecture and set as a game competition. The students' behaviors were observed and recorded.

Results: During free game based learning website was implemented for teaching 168 fourth-year pharmacy students, one hundred percent of them participated the activity. Almost students relaxed and were satisfied. They laughed, craped their hands and produced loud noise. Most of them were proud when they could answer question correctly and got high scores.

Discussion: Previous study reviewed that the free game based learning websites may be a useful tool for Pharmacy teaching course especially for evaluation the students' perception and understanding. The advantages of this tool are easy to access, interactive, and low-cost expenditure. However, further researches are needed to confirm about usefulness for increasing learning capacity of the students.

05-PE Abstract

Japan Student Pharmacist Trip to Study American Pharmacy

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Abstract

Japan Student Pharmacist Trip to Study American Pharmacy

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Kobe Gakuin University (KGU) School of Pharmacy conducts a study abroad trip every two years for students to learn about American pharmacy. This program aims to broaden students' perspective of pharmacists' roles internationally and help students apply what they have learned to their future practice. The trip also provides an opportunity for personal growth and to develop relationships with American students and faculty. Participants are expected to complete a project while in the US. A group of 20-30 students and 2 faculty visit the west coast (University of Arizona, University of the Pacific, University of California San Francisco, UC Davis Medical Center) or the east coast (Duquesne University, National Institute of Health) alternately every 2 years. This study abroad program is related to our international Visiting Professor program in which KGU invites clinical faculty from an affiliated school twice a year. The Visiting Professor gives lectures and meets with students and faculty, providing an opportunity to learn the latest in US pharmacy practice and pharmacotherapy. Recently KGU also started accepting American pharmacy students (University of Arizona, Duquesne University and University of Pacific) further expanding our international exchange program. After returning from the US, KGU students present the results of their experiences and project results to KGU faculty and students. The 40 year old KGU international program is unique in Japan and can serve as a model for other programs seeking internationalization of their students and faculty.

06-PE Abstract

Primary Care Pharmacy Curriculum in Walailak University

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Abstract

Primary Care Pharmacy Curriculum in Walailak University

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Background: School of Pharmacy, Walailak University has been established to produce pharmacists for working in primary care level, according to the philosophy and objective stated in the curriculum. Due to the University's responsibility for the community nearby which people sacrificed their homeland, the learning process for students through the course has been employed.

Objective: To integrated learning activities into the community in order to develop primary care pharmacy competency of the students.

Methods: The pharmacy students' skill in primary care model for pharmacy curriculum was developed based on the Bloom's taxonomy theory[1] and has been used since 2007. The model consists of the goals that students must reach in each year, together with the list of subjects and activities related. Pharmacy students were assigned to take part in healthcare for the specify families in the community from first year. Assessment was done by data gathering from the students before they graduated, using focused-group interview and 1-page writing. Feedback from the community was also compiled by participants interviewing.

Results: The pharmacy students were assigned to do activities or participate in community-based learning subject at least 1 time per semester. Focused-group interviewed with the students showed that they could be able to understand patients in the communities and practice with them easier during the professional practice courses. They realized about factors influenced on medication adherence of the patients. Moreover, skills in community practice were developed. Interview with participants in the community showed that the elderly were happy because the students took care for their drug use and also other dimensions in health. They could be able to apply knowledge retrieved from the students for their daily life use. Suggestions from the students were integrating the community-based learning into every subject if possible and allowing them to create their own activities.

Discussion: The pharmacy students' skill in primary care model for pharmacy curriculum was useful. Integration of learning in the classroom and doing activities in the community's for health status improvement was key success factors.

07-PE Abstract

The Evaluation and Development of Computer-Assisted Instruction Program in Pharmaceutical Chemistry and Pharmacology of Steroids

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Abstract

The Evaluation and Development of Computer-Assisted Instruction Program in Pharmaceutical Chemistry and Pharmacology of Steroids

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Background: Computer-assisted instruction (CAI) is used worldwide especially in pharmaceutical chemistry and pharmacology classes. It is expected that the effects of students' achievement on lectures could be better. As well as pharmacy students should be proficiently equipped integrated lessons in order to advocate the rational drugs use. Therefore, this study interesting in a good fundamental knowledge of steroids due to a wild range of pharmacological activities and adverse effects.

Objective: To develop and evaluate CAI about basic knowledge of steroids in 3rd year pharmacy students (n = 40) and assess the outcomes of students' learning at Faculty of Pharmacy, Rangsit University.

Methods: The experiment was conducted from August 2015 to December 2015. This chapter included an overview of steroids, structure activity relationship (SAR), and pharmacological and adverse effects. Forty students were randomly divided into two groups non-CAI (hand-out) (n=20) and CAI study (n=20) in order to allow the students determine lesson understanding via performing a pre/post test comparative evaluation. Both groups were provided traditional lectures and were assigned to perform a pretest (15 questions, 5 multiple choice- questionnaires). This study was also provided students' perception for CAI using to achieve in learning steroids integration lessons after completing CAI. The evaluation form for students' perception on the CAI effectiveness with 5-point Likert scale: excellent, good, average, poor and very poor. The survey composed of 4 major aspects, namely the number of questions about content, illustration, sound, and understanding of content.

Results: The score for the aspects were 4.16±0.83, 3.95±1.05, 3.45±0.89, and 4.35±0.59, respectively. Additionally, students' perception on CAI was in a good level (>70%) for most aspects except the sound quality of CAI and the speed of narrator's speech (traditional lectures). The average pretest score before using hand-out and CAI were 7.26±0.96 and 5.82±1.15, respectively. The average post-test score after using hand-out and CAI were 11.15±1.31 and 13.05±1.10, respectively (p value $\leq$0.005, using independence t-test). Paired t-test was used for pre-and post-test intragroup comparison.

Discussion: This CAI program in combination with traditional lecture was effective and the students' perception was in a good level. Thus, CAI should be considered for further implemented to student classes and it showed notably ameliorate the understanding of integration of medicinal chemistry and pharmacology for pharmacy students, which is valuable for pharmacy education.

08-PE Abstract

Effectiveness of flipped learning, learning outcomes and satisfaction in Microbiology 1 course of pharmacy students in Chulalongkorn University

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Abstract

Effectiveness of flipped learning, learning outcomes and satisfaction in Microbiology 1 course of pharmacy students in Chulalongkorn University

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Background: Flipped learning model is an active learning method that can enhance students' knowledge rather than lecture-based teaching method, a passive learning model.

Objective: To implement flipped learning model in basic Microbiology 1 course and to assess learning outcomes and satisfaction.

Methods: The participants were 158 of the second-year students who registered in a course in the academic year of 2014. Two teaching methods were conducted in a half of semester of fourteen periods of schedule in a course. Eight periods for Flipped learning model, which were conducted before midterm examination and six periods for lecture-based teaching method, which were conducted after midterm examination. The students' and instructors' opinion, the difficulty of contents and examination in each period were not exactly different (one period per ten points of multiple choices examination). Active-learning in classroom was focused on answering questions by using clickers and discussion. Learning outcomes were evaluated by comparing the midterm examination scores with the final examination scores. The effectiveness of flipped learning outcomes was expected that mean of midterm examination scores should not less than 60%. The students' satisfactions in flipped learning model were assessed by using 5-Likert scale of two online questionnaires: 1) The expectation scores were determined before and after flipped learning model. The t-test was used for comparing pretest and posttest. 2) The satisfaction scores were compared with posttest of expectation scores for confirmation the result.

Results: The effectiveness of flipped learning outcomes were revealed that mean of midterm examination scores was higher than mean of final examination scores, 56.99 ± 8.8(71.23 %) and 49.77 ± 7.67(68.17%) respectively, significant difference (p<0.05) and those score (71.23 %) was higher than mean target score (60%). Comparison of pretest and posttest of expectation scores were significant difference (p<0.05). No significant difference (p>0.05) were observed, comparing posttest of expectation scores with satisfaction scores.

Discussion: The implementation of flipped learning was successful for enhancing students' knowledge but no satisfaction for self-learning before class time and preferred to learn with lecturer rather than learning with VDO. Even the benefits of this model are made clear to students, some of them still resist.

09-PE Abstract

Survey and Analysis on Patient Safety and Quality Improvement Education in Health Sciences Cluster Schools and Colleges in Thailand

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Abstract

Survey and Analysis on Patient Safety and Quality Improvement Education in Health Sciences Cluster Schools and Colleges in Thailand

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Background: The WHO Patient Safety Curriculum Guide launched in 2011 aims to help healthcare professionals learning in patient safety competencies. There are 11 patient safety topics, 1)What is patient safety, 2)What is human factors and why is it important to patient safety?, 3)Understanding systems and the impact of complexity on patient care, 4)Being an effective team player, 5)Understanding and learning from errors , 6)Understanding and managing clinical risk, 7)Introduction to quality improvement methods, 8)Engaging with patients and carers, 9)Minimizing infection through improved infection control, 10)Patient safety and invasive procedures, and 11)Improving medication safety. However, there are still lack of information on how future healthcare professionals are trained in this area in Thailand.

Objective: This observational descriptive study aims to explore the curriculums on patient safety and quality improvement teaching in undergraduate programs in health-science schools and colleges in Thailand.

Methods: A questionnaire was developed using WHO Patient Safety Curriculum Guide consisting of 11 topics. Three experts were asked to validate the questions using Item Objective Congruence index (IOC). The questionnaire was distributed to 167 undergraduate programs in health science schools and colleges. Data from the survey were analyzed using descriptive statistics.

Results: Fifty-two programs response to the survey (31.1 percent). Twenty-three responses are from undergraduate programs in nursing. Seven responses each are from medicine programs and medical technology programs. Six responses are from pharmacy programs. Five responses are from physical therapy programs. Four responses are from dentistry programs. Five programs meet all 11 topics shown in the WHO curriculum guide; Two programs each are from dentistry and nursing, 1 program in medical. Twenty-two programs meet more than 5 topics in the WHO curriculum guide; Twelve programs in nursing, 3 programs in dentistry, 2 programs each are from medicine, pharmacy and medical technology, 1 program in physical therapy. The results indicate differences in the patient safety and quality improvement curriculum among health science programs in schools and colleges in Thailand. The majority of surveyed programs do not meet the WHO guide in all 11 topics. Over a half of surveyed programs teach less than 6 recommended topics.

Discussion: The results from this research are beneficial in developing and guiding policies on implementing the WHO Patient Safety Curriculum in health science undergraduate programs in the future.

10-PE Abstract

Pun Gown Hai Kao Jai Din: A process of student learning with community

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Abstract

Pun Gown Hai Kao Jai Din: A process of student learning with community

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Background: 'Experts in medicine and health promotion', a philosophy of Faculty of Pharmacy, Mahasarakham University, has been recognized and embedded in mind of all students. Pun Gown Hai Kao Jai Din is a compulsory activity assigned to all 5th year students. It provides opportunity for students to learn community life and to practice contributing health promotion services to rural community. Students are expected to manage their teamwork and solve problems by themselves.

Objective: This is a descriptive report of the academic year 2015, to demonstrate learning outcomes among 110 students obtained from Pun Gown Hai Kao Jai Din. Three outcomes were focused: (1) ability to build up rapport with community; (2) ability to solve problems; (3) lessons learned that students gained from this activity.

Methods: Five modules involved in this activity in 2015. The health promotion was a major coordinating module. A 7-day stay in a selected community was a key event assigned. Students were challenged by the question 'how would you, as a pharmacist, help solve health related problems for this community? To accomplish this, students had to establish some strategies by themselves, under supervision of social pharmacy lecturers. Students explored and identified community health related problems by performing the 7 community tools, health survey, and SWOT analysis. Professional activities expecting to promote health in various topics were performed such as health screening, health education, individual counselling and so on. Ability to build up rapport with and work in community were assessed using a 4-scale rubric score (4=excellent 1=poor). Lessons learned from this activity were summarized from essays written by students.

Results: A total of 90 students (81.1%) performed excellent ability to build up rapport, while 84 of them (75.7%) were excellent in problem solving. Students expressed various aspects that they learned from this activity such as teamwork building, project management, applying knowledge to use in real practice, and community life that affected health behaviors.

Discussion: Although the process of evaluating learning outcomes is elaborately difficult and needs further refinement, however, this program shows a comprehensive community-based learning process which has incorporated key concepts of pharmacy profession, health promotion, work management and humanity. The activity can potentially enhance students to be able to work in community and understand humanized care.

11-PE Abstract

Common practice of community-based learning: Experience from Faculty of Pharmacy, Mahasarakham University

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Abstract

Common practice of community-based learning: Experience from Faculty of Pharmacy, Mahasarakham University
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Background: Pun Gown Hai Kao Jai Din is a community-based learning project assigned for all year-5-pharmacy students, Faculty of Pharmacy, Mahasarakham University. This project has been integrated to our PharmD curriculum continuously since 2004 with an expectation to enhance community skills among students. Tools used for community learning and activities can be varied depending on characteristics and health-related issues of the setting. However, from our 10-year experience, the common procedures and activities have not yet been summarized.

Objective: This study was to review and report the common practice used for this project in terms of community learning purposes, approaches, tools and activities.

Methods: Three qualitative methods were used. A documentary review was conducted by reviewing project reports of year 2009-2013. Semi-structured interviews were performed with 20 alumni and 5 lecturers ever involved thoroughly in this project. A brainstorming meeting of students and lecturers was additionally undertaken in order to discuss findings emerged from documents and interviews. All of these focused on reviewing project aims/objectives and extracting what community tools and activities were frequently conducted. Issues emerged repetitively from all sources were categorized prior to making summary of the common practice.

Results: This project emphasized on 3 objectives: (1) to provide opportunity for students to learn community life in particular behaviors affecting health; (2) to survey behaviors regarding health and medicine use existing in community; (3) to exchange knowledge and experience about health promotion between students and community members. Self-learning in community was a key strategy used. The students were assigned to set up the 7-day stay in a selected community. The 7 community tools and SWOT analysis were common tools to explore characteristics and analyze community. Health survey was normally conducted before the 7-day stay commenced to identify community health problems. Activities provided were generally relevant to health promotion, pharmaceutical care, and consumer protection depending on problems identified such as home health care, health screening, education about medicines and health products, and so on. Activities building up relationship between students and community were also established, e.g. sport day.

Discussion: This project has a clear objective to encourage students to explore community life and promote health by the means of self-learning process. Students can contribute various activities to support community health. Lecturers can also involve and improve their community skills. This information is useful to further develop a manual of community learning for pharmacy students.

12-PE Abstract

Cost Estimation in Producing Pharmacy Graduates at Chulalongkorn University

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Abstract

Cost Estimation in Producing Pharmacy Graduates at Chulalongkorn University
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Background: Cost to produce university graduates has never been a significant concern for most public universities. It is, however, essential to estimate true cost, and learn how much the universities were supported by the government. If the support was inadequate, how much fee do we have to collect from students.

Objective: This study aimed to estimate the cost of producing pharmacy graduates at Chulalongkorn University, both undergraduate and graduate level.

Methods: Expenditure in 2015 fiscal year from three cost centers; administrative, educational support and educational providing centers were retrospectively collected from the faculty's accounting department. Cost of fixed asset such as laboratory instruments, classroom and teaching instrument were included, but land and building were excluded in the analysis. Step down method was used to allocate cost from indirect cost center to direct cost center. The analysis was based on the university's perspective.

Results: Cost of producing Pharm D graduates was found to be 116,906 Baht per person per year (PPPY) or 701,436 Baht throughout six-year curriculum. Cost to produce students in Pharmaceutical Sciences track was more expensive than Pharmaceutical Care counterparts (147,461 vs 88,721 Baht PPPY). It was also found that, on average, for one Pharm D graduate, the government have to support 80,565 Baht PPPY or 68.9% of the total cost. Cost of producing MS and PhD graduates were 550,900 and 665,321 Baht PPPY while the fee collected from students was 62,000 Baht PPPY. This means the government had to subsidize 88.7% and 90.5% in producing MS and PhD pharmacy graduates. It was also found that labor cost, capital cost and material cost were accounted for 47.9%, 26.32% and 1.19% accordingly.

Conclusion: The Faculty of Pharmaceutical Sciences, Chulalongkorn University was highly subsidized by the government in producing Pharm D, MS and PhD graduates. It was worth noted that the higher the numbers of laboratory credits required, the more variety of elective courses offered, and the lesser the number of students registered in particular courses, were related to higher unit cost.

13-PE Abstract

Perceived Benefits of Experiential Learning Activities in Hospital Pharmacy among Second- and Third-Year Pharmacy Students

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Abstract

Perceived Benefits of Experiential Learning Activities in Hospital Pharmacy among Second- and Third-Year Pharmacy Students

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Background: Experiential learning has been recognized as an important component in pharmacy education. However, the benefits of such an educational learning during the early years of training have not been reported. This study aimed to determine the benefits of experiential learning in hospital pharmacy as perceived by the second- and the third-year pharmacy students. The study result should inform the course instructors to improve the design of curriculum for the future students.

Methods: The second- and third-year pharmacy students who registered in the academic year of 2015 at Thammasat University were assigned to spend a 2-hour session (from 5 to 7 PM) with hospital pharmacists in the outpatient pharmacies at Thammasat University Hospital. They were given specific behavioral objectives and guided learning activities in advance before their sessions. Learning activities included participating and observing the medication preparation and dispensing process, and discussing with pharmacists in the aspects of patient care. The students were required to reflect and share their learning experience through oral presentation and a written report. After completion of all activities, students were asked to complete a questionnaire with 5-point rating scale (from strongly agree to strongly disagree) to identify their perceived benefits of the activities and suggestions for course improvement.

Results: A total of 48 students returned the questionnaires (86% response rate). The majority (93.75%) agreed that the learning activity made them realize significant roles of hospital pharmacists in promoting patient safety. More than half (66.67%) agreed that the learning activity was beneficial to their professional training; however, 31.25% were uncertain. The majority (82.23%) recommended providing this experience to the next year students. Additionally, 87.5% of the respondents agreed that having sufficient medication-related knowledge were necessary prior to this activity, implicating that the early experiential learning gave students' awareness of acquiring adequate academic competency before entering professional practice.

Conclusion: Pharmacy students perceived that the experiential learning in hospital pharmacy during the early years of their training was beneficial and suggested providing this activity to the future students.

14-PE Abstract

Blended learning in biochemistry classroom for pharmacy students

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Abstract

Blended learning in biochemistry classroom for pharmacy students

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Background: Learning outcome in pharmaceutical science can be successfully achieved from both formal lecture-based and online learning environment. Although most students are familiar with digital learning and educational technology tools, which incorporated with this educational innovation into conventional curriculum is timely needed.

Objective: The current study aimed to investigate opinions of pharmacy students on blended learning of biochemistry.

Method: In this study, the second year pharmacy students from both pharmaceutical science and pharmaceutical care programs registered for biochemistry course, the first semester, an academic year in 2014, the course provided teaching materials, PowerPoint slide files in advance via BlackBoard learning management system supported by Chulalongkorn University. In addition, students were encouraged to have the self-study online which utilized selected different multimedia platforms and websites; namely the newly developed blog “ilovebiochemistry.wordpress”, YouTube EDU, MERLOT, CAR Chula database, and other websites. Questionnaires and focus group activity that concerning opinions on contents, media forms, accessibility and relationship with other subjects were gathered from 17 students. The content analysis was then performed.

Results: According to questionnaire answers, this study found that students accessed learning contents from both computers and mobile devices. They were more familiar with the official university platforms and YouTube than the others. Although students were satisfied with the usage of blackboard for lecture-guided learning materials storage, the interface features, functional utilization but the CUCAS evaluation system has to be improved. Students were then asked to provide more information during focus group activity. The selected online learning platforms were reported to be useful for their self-learning and practices. However, blended learning contents from different platforms have to be more organized and more specific according to lesson plans. Mobile device compatibility is important for content accessibility. Students were concerned about their English proficiency in learning online information, which is difficult for students to understand and integrate new knowledge.

Conclusion: Students’ perception and experiences on biochemistry online learning materials and tools are preliminary presented. Students were satisfied with the selected online learning platforms. Designing tailor-made online contents suitable for pharmacy students and English language proficiency seems to be critical. Further development of blended learning environment for this subject is required.

15-PE Abstract

Concept, method and learning outcome of lecture-based teaching method by using multimedia online in Microbiology 1 course of pharmacy students

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Abstract

Concept, method and learning outcome of lecture-based teaching method by using multimedia online in Microbiology 1 course of pharmacy students

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Background: Active learning of students was conducted by using multimedia online. PowerPoint materials of contents were posted on Blackboard program and VDO clips from Youtube were linked to Blackboard program. Those instruction models could support lecture-based teaching method and enhance students' knowledge and student-centered learning.

Objective: To investigate concept, methods and learning outcomes by using Blackboard program for development of lecture-based teaching method in Microbiology I course.

Method: The participants were 143 of the second-year pharmacy students in Chulalongkorn University who registered in a course in academic year of 2013. The students were assessed before and after lecture-based teaching by using two groups of questionnaire: 1) four topics of content, 10 points of 4 multiple choices per topic using pretest and posttest. The t-test was used to compare pretest with posttest. 2) The 5-Likert scale of students' satisfaction in lecture–based teaching method, pretest and posttest, including open-ended questions about the advantage and disadvantage of using Blackboard program to support lecture-based method.

Results: One hundred and four from 143 of participants (72.22%) were studied on Blackboard program. Statistically significant difference ($p<0.05$) of contents of 4 pretest and 4 posttest scores were observed and mean of 4 posttest scores were higher than 4 pretest scores, 8.9±0.9 and 5.3±1.1, respectively. It showed that students were interested in learning in classroom more than self-learning with Blackboard program. Independent t-test were used to compare mean of 4 pretest scores of subject contents with each other of male and female participants, no significant difference ($p>0.05$). The students' satisfaction in lecture-based teaching method from pretest and posttest were assessed and no significant difference ($p>0.05$). The mean of pretest and posttest scores of those were 3.4±1.1 and 3.56±0.7, respectively. The advantage and disadvantage of using multimedia online has been shown as the frequency statistic of column graphs.

Discussion: Most students satisfied with active learning and requested for all of PowerPoint materials in Microbiology 1 course being posted on Blackboard program. Unfortunately, learning outcomes were observed; mean scores of the final exam in academic year of 2013 less than year of 2012, 57±7 and 63±8, respectively.

16-PE Abstract

Developing Pharmacy Students' Ability and Attitude to Work with the Community through Project-based Approach

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Abstract

Developing Pharmacy Students' Ability and Attitude to Work with the Community through Project-based Approach
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Background: Developing ability and attitude to work with the community of pharmacy students is a crucial role of all pharmacy schools. Not only enhance students' understanding on patients' drug use reasons and social and economic factors affected but it also would lead students to take care of the patients properly, both in terms of professional care and relevance to patients' needs. Chulalongkorn University is located in central Bangkok; consequently, the students have to learn to work with urban crowded communities nearby which are entirely different from rural communities. Consequently, prior to let the students learn from the fields, the instructors needed to prepare them capable and to provide things such as safety condition, time arrangement, cost of travelling, and mentors from the community. The project-based approach was designed as a strategy to bring students with pride into the community and let them learn about health problems from real situation and understand patients' drug use from experiences.

Objective: to develop pharmacy students' ability and attitude to work with the community through project-based approach.

Methods: Ability score was constructed as ability to detect, analyze, prioritize the problems and to propose recommendation, including ability to plan, do, check, act and evaluate what have done whereas attitude score was developed with community's images from unsafe or dull places to places providing opportunities to try on new things. 158 of the third year pharmacy students were divided into 12 groups, each group consisting of 12-14 students. Students had a three-week assignment to identify community health problems. During the fourth and fifth week, each group developed and organized a health promotion project, consisting of innovative activities to improve community health. The last task before leaving was to evaluate their own projects with the community. Students' ability and attitude to work with the community were assessed in terms of scores. Paired t-test was used to compare pretest and posttest score.

Results: It has shown that the posttest of the ability score was increased with statistical significance as shown [6.01.±1.32 and 6.64±1.53, $p<0.01$; full score = 10].On the contrary the posttest of the attitude scores was a bit decreased [4.06.±0.44 and 3.96±0.51, $p<0.01$; full score was 5].

Discussion: The project-based approach can enhance students' ability to work with the communities but their attitude was needed to be improved by other methods. This finding will be used for course development in the future.

17-PE Abstract

Factors Affecting the Adoption of e-Learning at Faculty of Pharmaceutical Sciences Chulalongkorn University

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Abstract

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Background: Chulalongkorn University encourages faculty members to use educational technology especially e-Learning to support their teaching and learning process, to improve the quality of education.

Objectives: 1) to study the level of e-learning adoption 2) to study the factors that influence e-learning adoption 3) to obtain specialists' opinion concerning strategy to increase adoption of e-learning at faculty of Pharmaceutical Science, Chulalongkorn University

Methods: The samples of this research consist of 104 lecturers at faculty of Pharmaceutical Science, Chulalongkorn University and five e-Learning specialists. The data were collected by means of questionnaires and interview for the specialists. The quantitative data were analyzed by frequency, percentage, mean, standard deviation, skewness and kurtosis. The factors that influence lecturers' acceptance of e-learning adoption were analyzed by Structural Equation Modelling (SEM) using Chi-Square and T-statistics. The qualitative data were analyzed by content analysis.

Results: 1) The level of lecturers' acceptance of e-learning adoption was between low and medium. Among five stages, awareness stage had the highest average score followed by acceptance stage, decision stage, interest stage and adoption stage respectively. The lecturers understood that e-learning was a beneficial educational technology and fully known that it was already adopted at the faculty. The lecturers also had positive attitude toward e-learning and admitted that e-learning was accommodate and beneficial. 2) The factor which had the most influence toward the lecturers' adoption of e-learning was their motivation in the aspect of intrinsic motivation to produce media or arrange e-learning classroom. The following factors were lecturers' attitude towards e-learning, awareness of e-learning in the aspect of worthiness and benefit, and environmental factors which support e-learning adoption in the aspect of the support of faculty board. 3) SEM revealed that the procedures toward lecturers' acceptance of e-learning adoption comprised of 3 procedures as follow; (1) Six factors of faculty's support: (2) Four factors of lecturers' skills and attitude (3) Two factors of e-learning development and management; contributed to the success adoption of e-Learning.

Discussion: The adoption of every innovation in organization cannot success without preparation of proper conditions. Not only organization's policy but also the understanding of benefit, motivated mind of participants, and supporting factors to make the innovation adoption success.

18-PE Abstract

Interprofessional Education for Humanized Patient Home Care: A Collaboration among Faculty of Medicine, Faculty of Pharmacy and Faculty of Architecture, Urban design and Creative Arts Mahasarakham University

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Abstract

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Background: With the philosophy of Mahasarakham University (MSU) **"**Public devotion is a virtue of the learned", students have been educated to deliver humanized community care. Interprofessional education (IPE) is a new educational approach to provide and support health-related professionals students the collaborative team environment to deliver the patient-centered care. Faculty of Pharmacy, Faculty of Medicine, and Faculty of Architecture, Urban design and Creative Arts purposed an IPE collaboration not only to enhance the humanized health care but also to promote the quality of patient home environment.
Objectives: This study aimed to provide lectures, activities and home visits for three professionals students and to evaluate the effects of all activities on students' attitude and their learning
Methods: We established an IPE working team, preparing 2 game-based activities**,** 3 lectures including INHOMESSS concept, drug and community, and universal design and environment to 230 the second year students from three faculties. Students were divided into 30 groups, each group comprised of 4 pharmacy students, 2 medical student, and 2 architecture students. Each individual group was assigned to do patient home care 2 times. Students' attitude on interprofessional team was assessed before and after home visits, and their learning and performance were assessed by health professionals and the health volunteers in each group.
Results: A total of 233 students had the significant improvement on their attitude on interprofessional team. They reflected about the benefits of IPE on their learning with other health professional student, idea sharing, team building and communication skill, patient goal setting, and quality of home care for their patient and family. All health professionals including home health care nurse, physician, pharmacist, and health volunteers satisfied with students' learning and performance on home care and gave high score to students (70% of the total score or greater). Patients were satisfied on humanized home care providing by a group of students.
Discussion: IPE will provide opportunity for health-related students to work together in a collaborative team and to deliver good patient-centered care. They have learned each other, shared idea, focused more on patient as the holistic approach and concerned about home environment for improving patients' quality of life.

19-PE Abstract

An experience on transformative learning in a Thai conventional pharmacy education

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Abstract

An experience on transformative learning in a Thai conventional pharmacy education

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Background: Transformative learning is imperative for Thai higher education in the midst of 21st century learning paradigm; however, it is not well understood and adopted in pharmacy schools.

Objective: This study was a phenomenological qualitative research aiming to unfold how a pharmacy school with a traditional orientated education system anticipated the mainstream.

Methods: There were 28 pharmacy students and 6 faculty members including a faculty administrator participated in the study. The participants were recruited depending on their teaching performance in the way of transformative education. Data was obtained by in-depth interviews, and analyzed by inductive process. Triangulation was implemented to assure the themes of findings.

Results: The findings indicated that there were meaningful maneuvers on transformative learning happened in multi-levels of the school even though there was no considerable administrative support. There were transformative learning processes localized in particular courses depending on individual faculty members who appreciated the change in students' mindsets as an achievement of teaching. They taught by coaching in real situations and motivating students to think and decide what and how to learn by themselves, and evaluated the learning outcomes by reflection giving meaningful clues for development. Evidences from individual students showed that these teaching strategies vitally flourished their learning value and goal in profession. Moreover, there was a sign of the school administrative attempt to initiate a systemic move toward transformative learning by mapping and interrelating content taught and teaching strategies in between courses.

Discussion: Although the happenings had trivial impact on the overall school educational system; the experiences evidenced that transformative learning was inherited in the conventional pharmacy school. Moreover there was a clear intention to move further in school-wide level and work directionally to achieve transformation as an inevitable learning outcome of pharmacy education.

20-PE Abstract

How pharmacy students enhance their learning: the experience from a Thai pharmacy school

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Abstract

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Background: The circumstance of Thai pharmacy education has been changed substantially since the National Educational reform was effective in 1999. Learner-centered education became imperative and student's learning was recognized as an indispensable mechanism for educational achievement. Knowing how to enhance student learning is then inevitable not only to align with the current learning paradigm, but also to achieve better learning outcomes.

Objective: This study aimed to explain the reality behind the effectiveness of students' learning in the changing educational context by using a phenomenological qualitative research.

Methods: 55 pharmacy students with a high accumulative grade from the first to final year were invited to participate in focus group discussion and follow up by telephone interviews. Physical artifacts of students' handwriting notes were also collected and analyzed to increase data richness. Content analysis and triangulations of data were undertaken and conceptualized into themes.

Results: Data showed that students gradually developed how they perceived the meaning of effective learning process from year to year of their school life. Senior students in the final year became realize in the importance of self-directed learning when they know what to learn next and the importance of learning by using their knowledge in real situation. The finding indicated how pharmacy student's learning was enhanced: 1) Effective strategies for earning high scores included learning engagement, knowledge content management and thoughtful conceptualization, and well planned time management. 2) Vibrant instructional style was needed to foster a better learning. 3) Intrinsic motivating factors empowering students' learning were family engagement, professional awareness, and social value for learning

Discussion: The findings from the study are meaningful for faculty members and administrators of pharmacy school to plan how enrich student's learning. In addition, the knowledge from the study will help faculty members to develop their effective teaching strategies.

21-PE Abstract

Service learning in community health and drug utilization

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Abstract

Service learning in community health and drug utilization

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Background: Health system course for the third year pharmacy students at Thammasat University comprised of the topics about health care system, community health, and drug system. The course was designed to provide experiential opportunities for the students to learn in real situation context and to develop students' skills in community engagement.

Objective: To support pharmacy students on how to identify community health problem and drug utilization problem using service learning.

Methods: The 3rd year pharmacy students in the academic year of 2015 were assigned to create a one-time service project which was part of the health system course. After 4-hour lecture-based teaching about community health problem, students spent four hours to survey the community at Klong 4, Klong luang district, Pathum Thani. The survey data was analyzed, planned, and implemented the solution to solve the community health problems.

Results: The information from the community survey such as demographics, socio-demographics, environmental health, people's health knowledge and attitude was discussed. The steroid use problem as "Ya-chud" out of the direct to the consumer drug advertisement (DTCA) problems was chosen by the students. They launched campaign against using steroid as "Ya-chud" and provided information about risk of steroid consumption at Klong 4, District health promoting hospital. After the service learning, all students perceived that gained benefits of service learning are 1) interpersonal development, particularly the ability to work well with others, and building leadership and communication skills 2) skills in problem analysis, problem-solving, critical thinking, and cognitive development 3) the experiential activities improved students' ability to apply what they have learned in the real situation and 4) understanding the roles of pharmacists in health system and the responsibilities of pharmacists in drug system.

Discussion: The service learning supported the students to achieve their learning outcomes, personal outcomes as well as improving their social responsibilities.

Discussion: The findings from the study are meaningful for faculty members and administrators of pharmacy school to plan how enrich student's learning. In addition, the knowledge from the study will help faculty members to develop their effective teaching strategies.

22-PE Abstract

Evaluation the Effectiveness of Flipped-Learning in 'Adverse Drug Reactions and Drug Interactions' Course

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Abstract

Evaluation the Effectiveness of Flipped-Learning in 'Adverse Drug Reactions and Drug Interactions' Course

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Introduction: Flipped-Learning is an instructional strategy that reverses the traditional learning procedure by delivering instructional content outside of the classroom. The homework in the traditional way of teaching was reversed to be the activities in the flipped classroom. Flipped-Learning will provide opportunity for each student to study at their own pace and to have effective time management in the classroom to enhance their understanding with learning activities and interaction in the class. The objective is to study the effect of Flipped-learning in 'Adverse Drug Reactions and Drug Interactions' Course which is the elective course for the fifth-year pharmacy students.

Methods: Each group of 6-7 students was assigned to study the content of one topic and case studies. Advisor will provide guidance for searching drug information. Then the content was post on web course for other students to learn before attending and doing case study in the class. The research data were collected from 1) The Constructivist Online Learning Environment Survey (COLLES). Paired-Sample T test was used to statistical analysis at the 0.05 level of significance. 2) students' comments in the web board 3) Chulalongkorn University's end of semester student's satisfaction survey (CU-CAS).

Results: Data from COLLES showed that students had better learning interaction, critical thinking and peer support than they expected. Students found that the relevance to professional practice, the interpretation and the tutor support met their expectation. From teacher's observation, students had fun and well participated by raising their hand to answer the questions. Students practiced to think critically about the cause of adverse drug reaction and drug interaction in the case study. The evaluation in CU-CAS showed that the academic year of 2014 (2557), students were more satisfied with teaching and learning than that the last academic year of 2013 (2556) (4.27 vs. 4.00 score from 5). In addition, the score of teaching quality this year was also higher than last year (4.57 vs. 4.03 score).

Conclusion: Flipped-learning increases the quality of learning in at least three aspects that are learning interaction, critical thinking and peer support. Students were satisfied in their learning with the high level.

Keywords: Flipped-Learning; Learning interaction; Critical thinking; Peer support.

Social and Administrative Pharmacy

(Full Paper)

01-SAP Original Article

Comparison of quality control systems for traditional medicine in Thailand and China

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Abstract

Comparison of quality control systems for traditional medicine in Thailand and China
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Background: Traditional medicines such as raw materials and products are widely used in China and Thailand for a long time. In China, the proportion of traditional medicine products in the National List of Essential Medicine increased steadily and the total export amount of traditional medicine remained an upward trend in the recent years. Thailand is a country with rich plants resources and has a unique traditional medicine system. Thai traditional medicine may provide global traditional medicine market with opportunities to purchase a variety of conventional medicines. The quality control systems of traditional medicine have a profound impact on trading conventional medicines.

Objective: The aim of this paper is to compare the quality control systems for traditional medicine between Thailand and China.

Method: The study was conducted by using secondary sources, which are academic journals, magazine and newspaper articles, market reports, books, and websites.

Result: There are five key points of similarities and differences which can be found (1) the Chinese national standard for traditional medicine is more complete than Thai; (2) China has centralized government control over the whole process from raw materials in specified markets to electronic supervision for all logistics process of traditional medicine; (3) Thailand has a decentralized approach in this system and supply of raw materials is the responsibility of primary producers. The crude drugs of traditional medicine can be purchased from traditional medicine drug stores or primary producers; (4) some hospitals take on the responsibility to identify raw materials of traditional medicine in Thailand; (5) GMP was applied in the manufacturers in both countries.

Conclusion: The quality control system of traditional medicine in China can present an example to Thailand in terms of the standard and logistics of traditional medicine, so as to help Thailand to integrate their own system.

Abbreviations: FDA, HPLC**-**MS, QC, TM

Keywords: traditional medicine, quality control system, Thailand, China

Introduction

Traditional medicine is a part of ancient cultural heritage and it is well known that traditional medicine and modern medicine coexist in Thailand and China. To boost the internationalization and modernization of traditional medicine, there are common problems that have to be faced. Quality control of raw materials and government authorities make complex regulatory systems assure the consumer that traditional medicines can maximize health benefits and minimize health risks and that the traditional medicines are genuine.

There are two national standards for medicine in China, which are the Chinese Pharmacopeia and the Departmental Standard of the Ministry of Health. The Chinese Pharmacopeia is the highest authority for quality control of medicine in China. It has 5,608 entries including 2,598 for traditional Chinese medicine and it's QC standards are overseen by the Chinese FDA [1]. The Chinese FDA uses drug laws and regulations to inspect and enforce standards and norms for medicine in all processes of drug distribution [2]. In addition, the Chinese Ministry of Health entrusts the Chinese Pharmacopeia Commission to produce the Chinese Pharmacopeia Supplement Standard, which serves as the Departmental Standard of the Ministry of Health and contains more than 4,000 traditional medicine products. The Chinese Ministry of Health ranks above the Chinese FDA and is responsible for the management of whole health care system in China.

The Thai FDA is the most important government sector for the management of drugs and traditional medicines. The Thai Herbal Pharmacopeia is issued by the Ministry of Public Health in Thailand and plays a vital role in quality control system of traditional medicine of Thailand. However, very few Thai traditional medicines are included in this handbook, just 36 items of crude drug from 35 species and 3 items of Thai traditional formulas, which makes it difficult to control the quality of the entire range of traditional medicines available [3].

High levels of consumption of traditional Chinese medicines around the world mean that those resources are imported or exported from China annually. An increasing amount of international trade in traditional medicine between Thailand and China may provide opportunities to enhance economic growth and technology advantage. To prompt this international business, Thailand and China have to give priority to control the quality of traditional medicine and sustain the species of traditional medicine. Some policies and regulations enacted in China may have a profound impact on preserve and maintain the rare species of medicinal plants. This kind of management system could be implemented in Thailand to control the market of crude drug from natural sources, while helping to promote these two countries to develop and protect their traditional and indigenous medicinal knowledge.

Method

This study was conducted using secondary sources. The literature survey covered four academic journals, magazine and two newspaper articles, five market reports and five books. Five websites of the relevant regulatory authorities and regulatory consultants including Chinese Food and Drug Administration (CFDA) and Thailand Food and Drug Administration (TFDA) were also included. The comparison of the quality control systems was divided into two sections: Standard of Quality and Logistics.

Results

1. Traditional medicine in China

In China, the crude drugs in Chinese traditional medicine includes more than 5,000 species with about 300 species used commonly [4]. Increasing numbers of traditional medicines are being allowed to apply in the clinic. The proportion of traditional medicines in the National Essential Medicine List saw a marked upward trend in recent years, rising from 30% in 2009 to over 40% in 2015 [5, 6, 7].

During the period from 2009 to 2013, the yield of raw materials remained stable at 30 million tons, however, the sales amount of Chinese crude drug slices rose 2.5-fold, from 6.3 billion USD in 2009 to 15.8 billion USD in 2013 [8]. Total exports of traditional Chinese medicine crude drug slices were worth more than 3 billion USD in 2008, with most (2.4 billion USD) exported to Indonesia, Thailand and Singapore [9]. In 2014, the export quantity of traditional medicines was around 2 million tons with a value exceeding 12 billion USD [10].

1.1 Standards for traditional medicine in China

Two national standards form an important part of the quality control system for medicine in China. Based on rule No. 32 in drug management law in China, all drugs sold have to meet these national standards [2].

1.1.1 Chinese Pharmacopeia

The Chinese Pharmacopeia is edited and issued by the Chinese Pharmacopoeia Commission, an institution under control of the Chinese FDA. Generally, the Chinese Pharmacopoeia Commission renews the Chinese Pharmacopeia every five years. The newest Chinese pharmacopeia was published in 2015 and the standards are enforced from 2016. The Chinese Pharmacopeia is divided into four parts; traditional Chinese medicine, modern medicine, biological agents and general rules, and excipients. Of the 5,608 entries in this book there are 2,598 entries for traditional medicine including crude drug slices, raw materials and Chinese patent drugs. Therefore, the first part of the Chinese Pharmacopeia contains the authoritative standards for traditional medicine. All of the standards for biological agents in the National Essential Medicine List can be found in the Chinese Pharmacopeia, and over 90% of traditional medicines and medicines in the National Essential Medicine List have been standardized. The developed techniques are widely applied such as HPLC-MS, high performance capillaryelectrophoresis and molecular identification of traditional Chinese material using DNA barcoding. Importantly, the general rules for traditional medicine are normalized, such as identification of raw material and processing of crude drug. The Chinese Pharmacopeia is the highest standard of drug in China [1].

1.1.2 Department Standard of the Ministry of Health

The Chinese Ministry of Health issues a national standard for medicines which are not covered in the Chinese Pharmacopeia. The Department Standard of the Ministry of Health is divided into three parts; Chinese patent drugs, chemical drugs and Zhang ethnic medicine. More than 4000 traditional medicine products have been listed in it since 1989. It differs from the Chinese Pharmacopeia because it adds newly patented Chinese drugs continuously in more frequent editions. Therefore, 20 volumes of Chinese patent drug standard have been issued since 1989 [11, 12].

Together, the Chinese Pharmacopeia and the Department Standard of the Ministry of Health make up the rules and regulations for quality control of all medicines in China. The establishment of standards for traditional medicines ensures that traditional medicines will meet the same standards as those required worldwide for modern medicines.

1.2 Logistics for traditional medicine in China

The logistical side for traditional medicine in China includes three national authorities; the Chinese FDA, MOH and State Administration of traditional Chinese medicine.

1.2.1 Raw material markets

To ensure reliable quality of traditional medicine raw materials, markets must obtain a business permit from the Department of Pharmaceutical Production and Operation of the National Council. There are only 17 markets approved to sell traditional medicine raw materials in China. The individual stores in these markets have to gain two certificates, which are the raw material business certificate from the provincial FDA and the pharmaceutical trade license from the provincial health department.

Only raw materials can be sold in the markets. Chinese patent drugs, Chinese traditional medicine preparation and western medications are unable to be sold. Some specially controlled materials such as pappy shell and wildlife have to be sold in stores with permits issued by the provincial government. Provincial FDA and provincial health department staff take responsibility

for quality control inspection of the raw materials and may supervise the environmental condition of the markets. All goods should be labeled with price, name, geographical origin and specification. Computers and new communication technology enable the Electronic Supervision of the raw material market. The collection of marketing information helps to the analysis of supply and demand and variations in price of raw materials. This system also makes it easy to track the source of raw materials to enable the identification of fake materials [13].

1.2.2 Manufacturing process

Two kinds of item, which are traditional medicine crude slices and traditional medicine products, must be processed by traditional medicine manufacturers that must obtain the corresponding good manufacture practice certificate from provincial FDA. The factories have to follow the correct manufacturing procedure and QC tests from the Chinese Pharmacopeia or the Department Standard of the Ministry of Health and then issue a QC report for each batch of goods for sale. Only if these regulations are met, the traditional medicine crude slices and products can be sold in pharmacies and hospitals [14].

1.2.3 Drug store or hospital

The State Administration of Traditional Chinese Medicine and the Ministry Of Health issue the management standard of traditional medicine prepared [15]. There is the guideline specific for drug stores and hospitals to sell traditional medicine.

The regulations for the sale of traditional medicine differ between drug stores and hospitals. The drug stores must acquire GSP (good supplying practice) approval to sell traditional medicine. GSP approval is provided by the provincial FDA and covers the drug quality control of procurement, storage, sales and transportation.

Hospitals have the responsibilities to set their own standards for the sale of traditional medicine. The standards are set according to the management standards and the hospital itself. In additions, the principles of Pharmaceutical Administration Law must be met.

1.2.4 Post-market monitoring

An adverse effect of drug is an undesired harmful reaction, resulting from a medication. An adverse event occurs during or after taking a drug, generally. Therefore, the adverse effects of drug must be monitored to ensure the safety of drug, especially for the new drugs. In the post-market of drug, the electronic monitoring system has been set up for observing all adverse effects. Anyone can enter this system via the website and report an adverse effect to Chinese FAD [16]. The Chinese FDA issues an annual report of adverse effect reaction.

By using electronic supervision, the logistics processes of traditional medicine, which include the supply of raw materials, manufacturing, sales and post-market can be effectively controlled. The whole quality control system for traditional medicine process in China is shown in Figure 1.

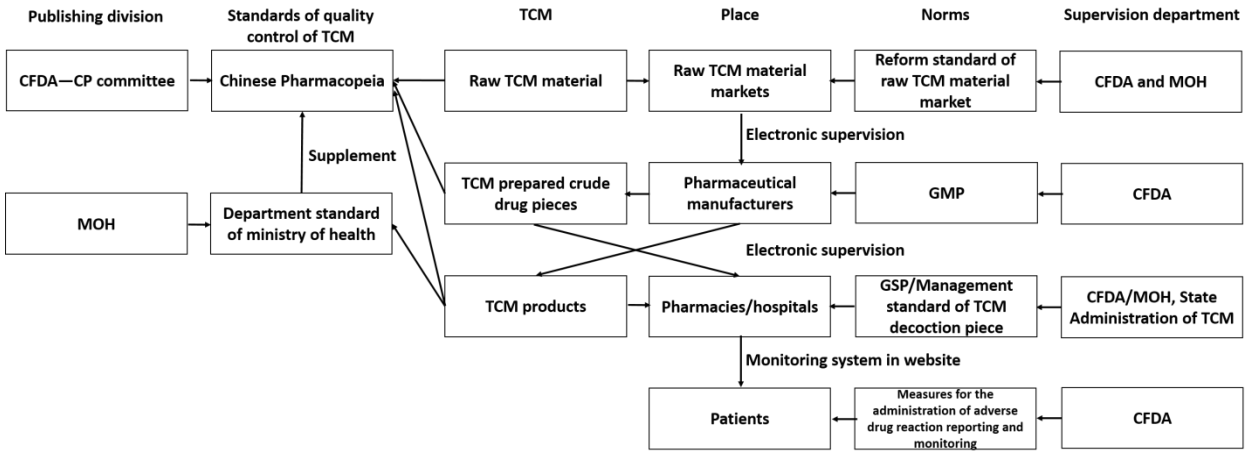

Figure 1. Chinese quality control system of traditional medicine

(CFDA: Chinese Food and Drug administration; CP: Chinese Pharmacopeia; TCM: traditional Chinese medicine; MOH: Ministry of Health; GMP: good manufactory practice.)

1. Traditional medicine in Thailand

Since western medicine was introduced into Thailand in the reign of King Rama III (1787-1851), it has had a negative impact on Thai traditional medicine. It has led to the abandonment of the systematic teaching of Thai traditional medicine in medical schools in 1916 [17]. The Thai government placed emphasis the role of traditional medicinal plants and Thai traditional medicine in the country's primary health care system at the time of the WHO's 4th Health Development Plan (1977-1981). Through the years, the Institute of Thai Traditional Medicine and Department for the Development of Thai Traditional and Alternative Medicine were established under the Thai Ministry of Public Health. The Thai government made a key policy to integrate Thai traditional medicine, which is the selection of herbal medicinal products into the National List of Essential Drugs [18, 19]. Nevertheless, there are only 80 items of herbal medicinal products listed (just account for around 10% of the total number) in the 2012 Thai National List of Essential Medicine [20].

In Thailand, more than 10 thousand plant species grow meaning there are abundant wild plant resources [21]. The Thai people have used herbs in their daily life for a long time, using some herbs to flavor food and others to treat diseases. About 200 Thai herbs are widely used in Thai traditional medicine [22]. In addition, a great number of ethnic Chinese live in Thailand, contributing to the popularity of traditional Chinese medicines. In Thailand, the amount of imported traditional Chinese medicines has been steadily rising. Yearly expenditure in Thailand on traditional Chinese medicine is over 500 million USD [23]. In addition, China has been the main foreign trade partner of Thailand since China and Thailand established diplomatic relations in 1975. Importing goods from Thailand worth 24.8 billion USD in 2014 [24]. Traditional medicines make up an important part of the import and export trade between these two countries.

1.1 Standard for traditional medicine in Thailand

The Thai Herbal Pharmacopeia is issued by the Department of Medical Sciences, Ministry of Public Health. This book is especially important for identifying quality in Thai herbal medicine. It contains three volumes with two supplements, 36 items of crude drugs from 35 species and 3 items of Thai traditional. However, a large amount of Thai herbal medicine is not covered in this book, making it difficult to be used to control quality. In addition to the raw materials, the standards of Thai traditional medicine products have to be integrated. The incomplete nature if the Thai traditional medicine standards presents a challenge to international trade in traditional medicine, particularly with China as the Chinese Pharmacopeia standards are used to control the quality of imported traditional Chinese medicines [3].

In 2012, the current status of Thai herbal medicine has been investigated. This article identified three priorities to improve and develop Thai traditional medicine. The collection of raw plant material, the identification of medicinal plant, and the extraction techniques should be standardized [25].

1.2 Logistics for traditional medicine in Thailand

The logistics for traditional medicine in Thailand is vastly different to China. The logistical side for traditional medicine in Thailand includes two national authorities, which are the Thai FDA and the Thai Ministry of Public Health.

2.2.1 Raw material markets

There are no official markets to sell the crude drug or raw material of Thai traditional medicines from the primary producer to purchaser. It means that the raw materials of Thai traditional medicine can be traded directly from person to person, to hospitals, drug store and manufacturers, either as fresh or dried materials.

2.2.2 Manufacturing process

The traditional medicine manufacturers in Thailand must acquire GMP approval as in China. Provincial Public Health Offices are the licensing authorities for manufacturers [26]. However, the manufacturers can directly purchase raw materials of traditional medicine from farmers, after which the raw materials are processed to products. Therefore, there is no control over the pre-processing of raw materials by manufacturers.

2.2.3 Drug store or hospital

In Thailand, drug stores have been divided into two types such as modern medicine drug stores and traditional medicine drug stores. All types of drugs stores can sell traditional medicine products. However, the traditional medicine crude drug can only be sold in the traditional medicine drug store [27, 28]. In addition, the hospitals take on the responsibility to identify the raw materials.

2.2.4 Post-market monitoring

Thailand has a similar process monitoring system for adverse effects of traditional medicine [29] as China.

Generally, the Thai quality control system of traditional medicine remains un-integrated. The primary mission is to complete the quality standards for Thai traditional medicines. Otherwise, Thai herbal medicine will be faced with the very serious problem of being eliminated by modern medicine. The lack of a quality control system also makes it difficult to export Thai herbs. The whole process of quality control system of traditional medicine in Thailand is shown in Figure 2.

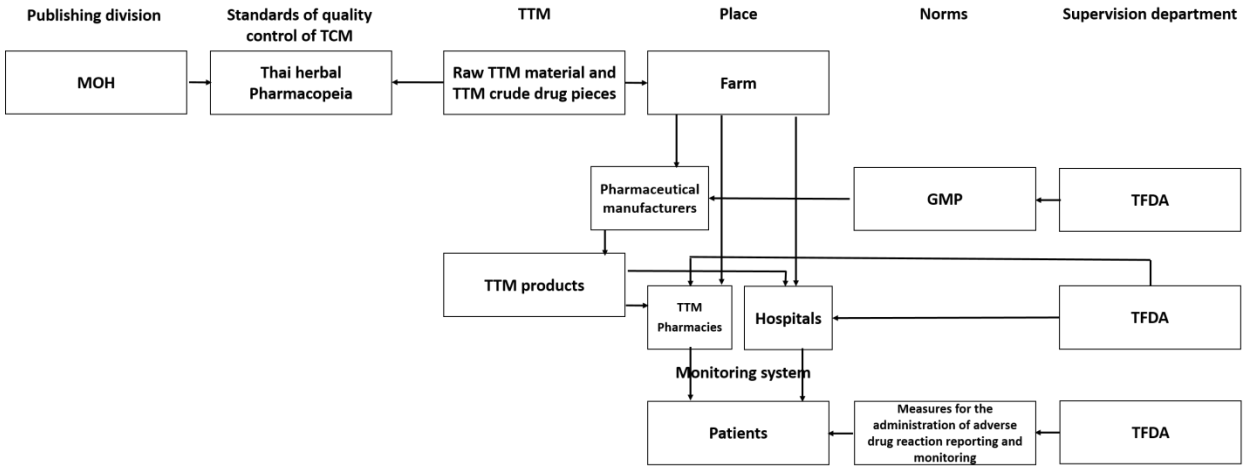

Figure 2. Thai quality control system of Thai traditional medicine

(TFDA: Thai Food and Drug administration; TTM: traditional Thai medicine; MOH: Ministry of Health; GMP: good manufactory practice.)

2. Comparison of quality control system of traditional medicine in Thailand and China

This study is a preliminary research to prove deeply into the current status of traditional medicine in Thailand and China. The basic frameworks of the quality control system of traditional medicine in these two countries have been showed in the figure 1 and 2. However, the details were not investigated in the norms of traditional medicine management and the implement of these norms. In this study, the similarities and differences of the quality control system in Thailand and China were summarized in Table 1.

Items		**Similarities**	**Differences**	
Standards		Two countries have national standard of traditional medicine	China	Most of TM used in common
			Thailand	Incomplete
Logistics	Raw material markets	--	China	Have
			Thailand	Do not have
	Pharmaceutical manufacturers	GMP approval, produce the drugs of traditional medicine	China	Pre-preparation of TM pieces was finished in GMP factories.
			Thailand	Pre-preparation of TM was finished by farmers.
	Hospitals	Sell TM	China	--
			Thailand	Hospitals take on the responsibility to identify raw material of TM.
	Drug stores	Must get the license from provincial FDA	China	GSP is the guideline to manage drug trade; any licensed drug store can sell products and pieces of TM.
			Thailand	Crude drug of TM can only be sold in traditional medicine drug store, but the product of TM can be sold in any drug stores.
	Electronic supervisions	In post-market, to oversight the adverse effect of drug	China	In all process of logistics of drug
			Thailand	--

Conclusions

A comparison of the quality control systems for traditional medicine in Thailand and China reveals a number of similarities and differences. The core steps in both systems ensure that appropriate methods are conducted before customers use the medicines. The most noticeable similarities are to set up the standard reference such as pharmacopeia and the requirement that all drug manufacturers and distributors must be licensed. However, Thai herbal medicine is not completely covered in the Thai herbal pharmacopeia. Moreover, most of Thai traditional medicine and Thai traditional medicine products do not have national standards or a quality control system for traditional medicine. There is no oversight in the processing and selling of raw materials in Thailand. To remain and prompt the international trade in the traditional medicine, Thailand should pay a closer attention to integrate the national standards of Thai traditional medicine products and enhance governmental management of the raw materials. On the other hand, the hospitals play a vital role in traditional medicine marketing in Thailand. The hospitals do not only apply Thai traditional medicine to treatment some illness, but also provide consultation with Thai traditional medicine. In China, government has to ensure regular certainty. It is suggested that the gaps between standards and managements of traditional medicine might be narrowed down in order to increase trading of traditional medicine.

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Health outcomes and public health

(Abstract)

01-HOPH Abstract

Incidence of Depression in Type 2 Diabetic Patients: 5-year Follow-Up Study

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Abstract

Incidence of Depression in Type 2 Diabetic Patients: 5-year Follow-Up Study

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Background: Depression is one of the most important comorbidities in patients with type 2 diabetes (T2DM). Therefore, screening and proper treatment can prevent its negative consequences.

Objective: To measure the incidence rate of depression in T2DM patients.

Methods: This retrospective cohort study used data retrieved from electronic health records from one community hospital in Ubonratchathani province, Thailand. Patients newly diagnosed with T2DM with ICD10 (E11) during January 1, 2007 to December 31, 2009 were included and followed up for 5 years or until diagnosed with depression. Depression was identified from ICD10 (F32-33) or receiving fluoxetine or sertraline at least for 3 months or presenting signs and symptoms with depression screening tool from Ministry of Public Health.

Results: Of 1,460 newly diagnosed T2DM identified, most were female (60.54%) and aged between 50-70 years old (54.76%). The overall incidence rate of depression in T2DM patients was 14.83 per person-years (95% CI = 12.25-17.96), 15.89 per person-years (95% CI = 12.53-20.16) in female and 13.21 per person-years (95% CI = 9.57-18.23) in male. The incidence rates of depression were 16.78 per person-years (95% CI = 13.71-20.54), 6.38 per person-years (95% CI = 3.19-12.76), and 13.46 per person-years (95% CI = 4.34-41.75) in patients receiving oral antidiabetic agents only, insulin only, and combined therapy, respectively.

Conclusion: The incidence rate of depression in T2DM patients from this study is higher than in normal population. Therefore, screening for early detection and treatment of depression in T2DM patients should be conducted regularly.

Keywords: Incidence, Depression, Type2 Diabetic Patient

02-HOPH Abstract

Cost Comparison and Patients' Satisfaction of Health Promotional Media on Enhanced Pharmacy Services Provided in Community Pharmacies in Thailand

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Abstract

Cost Comparison and Patients' Satisfaction of Health Promotional Media on Enhanced Pharmacy Services Provided in Community Pharmacies in Thailand

Suppachai Insuk*, Nilawan U-pakdee, Chuanchom Thananithisak, Pattamawan Kosuma, Itsarawan Sakunrag, Orarik Asuphon, Teerapon Dhippayom

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Background: National Health Security Office (NHSO), Thailand, has endorsed quality accredited community pharmacies to provide additional health promotion and prevention services, such as, antibiotic smart use, chronic diseases screening, family planning advice, sexual transmitted disease education, to the patients. The services are provided for free to any walk-in patients at the community pharmacy. However, these novel services are not well known to the patients.

Objectives: This research aims to explore patients' satisfaction and cost comparison among different promotional campaigns on additional services provided in community pharmacies.

Methods: Eight community pharmacies enrolled in the program. Three promotional campaigns were deployed to raise patients' awareness of the services, poster-banner, flyers and information on complementary paper bag. A self-administered survey was provided to the patient after receiving the service. The survey asked the patient on their awareness, satisfaction of the promotional campaign, and what campaign was the most influential. Costs were calculated using recurrent costs (material cost and labour cost).

Results: One hundred and ten patients answered the survey. Eighty-four percent of patients indicated that they were aware of the services from seeing poster-banner. Nighty four percent were influenced by the poster-banner to use the services. And eighty-eight percent was most satisfied with the poster-banner. The highest cost of promotional campaign was the medicine paper bags with a total of 20,000 THB (564 USD) per campaign. Cost of banner-posters and flyers were 19,200 THB (542 USD) and 13,160 THB (371 USD) per campaign, respectively.

Discussion: Additional services provided in community pharmacy are new and aim to help prevent patients from high-cost hospital services. An effective promotional campaign is needed to introduce the services to the patients. Banner-poster has proven to be effective and its cost was reasonable. Further investigation needs to be explored if the pharmacists' interaction with the patients could influence the decision to enrol in the additional pharmacy services. A study to explore cost-effectiveness of the promotional media is needed.

Keywords: Cost , Satisfaction , Media , Community Pharmacy

03-HOPH Abstract

Analysis of healthcare resource utilization, repeated fracture and health-related quality of life among Thai osteoporotic hip fracture patients during and after one-year follow-up and discharge

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Abstract

Analysis of healthcare resource utilization, repeated fracture and health-related quality of life among Thai osteoporotic hip fracture patients during and after one-year follow-up and discharge

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Background and Objective: High burden of chronic disease, osteoporosis hip fracture (o-hf) with variations of clinical management upon acute hospital admission reflected in outcomes during and after hospital follow-up and discharge were raised. We explored healthcare resource utilization, repeated fracture during one-year follow-up, and health-related quality of life (HRQOL) after one-year hospital discharge.

Methods: A Phase-1 was conducted in a private healthcare provider supported by a comprehensive data tracking system. Data from o-hf patients was retrieved by systematic computerized data tracking. Patients admitted for primary hip fracture coded ICD-10 S72.1 (confirmed by positive X-ray finding) in post-menopausal women aged $\geq$ 55 years was follow-up for 12 months. Patients' private confidentiality were strictly protected except for demographic, clinical characteristics, healthcare resource utilization and clinical outcomes. A Phase-2 was ethically approved in a public healthcare provider to prospective screen patients with primary diagnosis of o-hf. The health-related quality of life (HRQOL) were obtained with mails response. The HRQOL assessment was a patient-centered self-response by assessing with the medical outcome short-form 36-items health questionnaire survey (MOS SF-36). The MOS SF-36 score reliability were analyzed by employing inter-items consistency Chronbach's alpha coefficient for physical health summary(PHS), mental health summary(MHS) and Global health summary(GHS) and score also compared with Thai healthy volunteers. Descriptive statistical analysis was performed with 95% CI and a significant level of p-value <0.05.

Results: For a Phase-1, 59 hospital admissions 36 and 23 without and with comorbidities. Healthcare resource utilization, in terms of (a) overall hospital cost and charged, (b) all types of drug cost and (c) other direct medical cost incurred between o-hf with vs without comorbidities were increased by (a)+51% (p=0.043), (b)+63% (p=0.018) and (c)+113% (p=0.001). The relative risk of repeated fractures within 6 and 12 months were increased by +24% (p=0.016) and +17% (p=0.027). A Phase-2 investigation of 119 o-hf, mean age ±SD (years) of 74.7, ±11.0, 68 men and 51 women. The MOS SF-36 was reliable reflecting a Chronbach's alpha coefficient of 0.91, 0.82, 0.91 for PHS, MHS and Global health score 35-46%, 28-32% and 32-41% score point reduced as compared with healthy volunteers.

Conclusion: Healthcare management of osteoporotic hip fracture subsequent to acute hospital admission need reconsideration to optimize healthcare resource utilization and clinical outcomes during hospitalization and health-related quality of life after hospital discharge.

Discussion: Two different types of healthcare provider were noted, should similar management trend and outcomes be expected unless otherwise healthcare cost in private sector was higher. A recall bias mail response survey maybe noted and should demand minor statistical adjustment for interpretation.

Keywords: Healthcare resource utilization, Hip fracture, Health-related quality of life

School/College Posters Highlighting Your Institution's Activities (Abstract)

01-SC Abstract

Determining Predictors of Academic Success Using Student Admissions Data

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Abstract

Determining Predictors of Academic Success Using Student Admissions Data

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Background: Colleges and schools of pharmacy in the United States of America are continually focused on improving the methods they use to recruit and admit students that will be successful in their academic programs.

Objectives: This study evaluated our admissions data to assess predictors of student success in our school of pharmacy's Doctor of Pharmacy program.

Methods: Two years of admissions data {pharmacy college admissions test (PCAT) scores, grade point averages (GPA), interview scores, etc.} of pharmacy students were evaluated and compared to selected student outcomes (10 course grades, final cumulative GPA) to identify predictors of student success in the pharmacy program. Statistical analyses were conducted via SAS with separate analyses for the classes of 2014 and 2015 and with data combined for both classes.

Results: Data from 282 students were evaluated. Pre-pharmacy cumulative and science GPAs were the strongest significant predictors of the final GPA at graduation and individual grades in our science and therapeutic courses ($p<0.001$); correlations range from 0.4 to 0.52 for separate and combined data. Cumulative GPA was the strongest predictor of success in our therapeutics course, $p< 0.001$. Science GPA was the strongest predictor of success in our science courses, $p<0.001$. The PCAT composite score correlated more strongly with course grades (0.32-0.47) than with final GPA (0.28-0.4) for the class of 2015 and combined data. Individual subtests of the PCAT were statistically correlated with final GPA and course grades for the class of 2015 and combined data (0.16-0.45). Faculty interview scores were statistically significant for the class of 2015 and combined data, but weakly correlated with student outcomes (0.13 to 0.29). Students who completed pre-requisites at our institution were found to have a higher final GPA but this was weakly correlated (0.16-0.23) for the class of 2015 and combined data. Students whose admissions decisions were initially deferred after their interview showed statistically negative correlations with final GPA and course outcomes (-0.25 to -0.29) for separate and combined data. Neither holding a prior degree nor the student's assigned campus impacted final GPA or grades in science courses for the class of 2014 or combined data.

Implications: Admissions data may be class dependent when used to predict a student's success within a doctor of pharmacy program. However, general correlations can guide the admissions committee's decision on student acceptance.

02-SC Abstract

Global Health Pharmacy Educational Activities through the US-Thai Consortium for Pharmacy Education

Sirada Jones*, PharmD, MS, BCPS, BCCCP; Trisha Seys Ranola, PharmD, DCE, CGP; Tom Thielke, MS, FASHP; Connie Kraus, PharmD, BCACP

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Abstract

Global Health Pharmacy Educational Activities through the US-Thai Consortium for Pharmacy Education
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IJPS, **(***Supplement***)** 2016; 12**(2) :** 120
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Background: UW-Madison School of Pharmacy has participated in US Thai Consortium for Pharmacy Education since the early 1990's. Through commitments, leadership, and contributions of a group of faculty members, several international pharmacy educational activities are offered through the UW-Madison, School of Pharmacy, Office of Global Health.

Pharmacy Student Exchange Program: UW-Madison SOP signed an initial exchange agreement with the Faculty of Pharmaceutical Sciences, Naresuan University in 2007. The first UW-Madison PharmD student completed an international eight-week advanced pharmacy practice experience (APPE) rotation in Thailand in 2008. Student activities performed during the international practice experiences include the observation of traditional dispensing function and various roles of pharmacists in Thai health care system, as well as conducting research projects. In exchange, UW has hosted equal numbers of Thai PharmD students to participate in observational APPE rotation activities in Wisconsin. Preceptors in various practice sites including hospitals, community pharmacies, long term acute care hospitals, and the pharmacotherapy teaching laboratory have precepted Thai students. To date, over 20 students have successfully participated in the exchange.

International Pharmacotherapy Educational Training Fellowship: Pharmacotherapy teaching has become essential component for the development of clinical pharmacy faculty. Through the Office of Global Health, a pharmacotherapy educational training fellowship is offered to international junior faculty members. It is available in both short-term (3-5month) or long-term programs (12-24months). The teaching fellows have the opportunity to observe and actively engage in collaborative pharmacotherapy teaching as well as conducting pharmacy education-related research projects. The program is designed to equip international junior faculty with tools, techniques, and experiences in pharmacotherapy teaching, classroom management, and students' skill assessment.

International Hospital Administrative Leadership Training Fellowship: In 2012, the Office of Global Health in collaboration with pharmacy department of UW Health (UWH) implemented the first international health-system pharmacy administrative fellowship for international candidates who aspire to become pharmacy leaders in their home country. The program is available in 12-week experience or 12-24months experiences based on the candidate's experience and interests. It offers opportunities for international pharmacists/faculty who are interested in learning and obtaining tools, skills, and experiences necessary to lead the advancement of pharmacy practice in their home countries.

Conclusion: Initiatives offered by UW-Madison Office of Global Health, SOP in collaboration with the US Thai Consortium have provided learning opportunities and hopefully continue to impact personal and professional growth of participants.

03-SC Abstract

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Abstract

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Eastern Asia University is a private higher education institute in Thailand comprises of 12 Faculties and Colleges including Graduate School. The university responsibilities are engaging in providing for higher education over 20 years of growing in Aviation, Business Administration, Communication Arts, Engineering, Information Technology, Laws, Liberal Arts, Nursing , Public Administration, Science Program in Public Health and Pharmacy. The School of Pharmacy was established in March 2008 as one of the fast growing and active among 19 Schools of Pharmacy in Thailand.

The School of Pharmacy, Eastern Asia University is accredited by the Pharmacy Councils of Thailand for its 6-year Pharmacy curriculum leading to a Doctor of Pharmacy (Pharm. D.) and a 4-year Bachelor of Science curriculum leading to Bachelor of Science in Cosmetics and Health Products (B. Sc. in Cosmetics and Health Products).

School of Pharmacy is one of the university fastest expanding faculty purporting of intensive and extensive supervision for future investing of the university. It is expanding quickly in terms of innovative laboratory technology, retaining of experience teaching faculty staff members and a competitive student enrollment programs. The School of Pharmacy, Eastern Asia University aims extensively to contribute as part of the growing high quality pharmacy education of Thailand, under the direction of Thai Pharmacy Councils to support for increasing demand of pharmacists for healthcare provider and the industry in Thailand.

School of Pharmacy, Eastern Asia University strives to challenge its students to reach their highest potential inside the classroom and outside to capitalize for the integrity and morality in parallel with academic achievement. The school of pharmacy has also extended researches and developments as well as teaching supports with hospital affiliation networks. The long-term international collaboration in terms of researches and developments and pharmacy student exchange program among other Asian members had been achieved and is expanding internationally at presence.

Further information and inquiry are available via www.eau.ac.th and http://pharmacy.eau.ac.th/eng_ver/index.php

04-SC Abstract

Doctor of Pharmacy Programs at the Faculty of Pharmaceutical Sciences, Chulalongkorn University, Bangkok, Thailand

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Abstract

Doctor of Pharmacy Programs at the Faculty of Pharmaceutical Sciences, Chulalongkorn University, Bangkok, Thailand

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Faculty of Pharmaceutical Sciences, Chulalongkorn University, the first pharmacy school in Thailand, was established since 1913. The Faculty consists of 7 departments with 100 faculty members, 400 graduate students, and 1,000 Pharm.D. students. The pharmacy curriculum has been evolved from 4-year to 5-year and then 6-year programs in 1939, 1957 and 2009, respectively. Today, two 6-year Pharm.D. programs, Pharmaceutical Care and Industrial Pharmacy, are offered as an entry level toward pharmacy professional practice. Each Pharm.D. program enrolls 100 freshmen per year.

Both Doctor of Pharmacy Programs are competency-based curriculum. The Pharmaceutical Care Program requires the graduate to be able to work with the patient and other healthcare providers to ensure appropriate therapy and outcomes, dispense medications, promote health and prevent disease, as well as manage health and drug systems. The Industrial Pharmacy Program requires the graduate are fully competent in searching, concocting, inventing, and developing good quality medicines according to international standards. This program comprises 3 areas of electives including Pharmaceutical Technology and Quality Assurance, Drug discovery, as well as Social and Administrative Pharmacy. Industrial pharmacy students will start their elective courses during their 5th year of the program then choose to do rotations corresponding to their field of study. In addition to the functional competency, students from both programs are expected to have an innovative and inquiry-oriented mind, critical thinking, together with leadership skills.

To qualify for graduation and pharmacist licensure examination, students of both programs are required to do one capstone project as a group or individual project and pass 2,000 hours of experiential training which is divided into 400 hours of introductory and 1600 hours of advanced experiential practices. Students will spend their summers of 3rd and 4th years on introductory experiential training in primary care settings, including community pharmacy and health center, or hospital pharmacy. The advanced professional clerkship will be rotations during their final year.

In term of the professional qualifications, all pharmacist graduates from Faculty of Pharmaceutical Sciences, Chulalongkorn University possess adequate knowledge, competence and professional skills suited to the pharmaceutical practice as required by the Pharmacy Council of Thailand.

05-SC Abstract

The Global Classroom: Bringing Continents Together

Melody Ryan*, PharmD, MPH[1]; Li Yang, MS[2]; Jeff Cain, EdD[1];
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Abstract

The Global Classroom: Bringing Continents Together

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A number of technology changes such as the Internet, information-sharing software, outsourcing, offshoring, and supply-chaining have revolutionized the way business is conducted in the United States and around the world. Educational institutions have the responsibility to graduate globally competent students. The American Council on Education has defined global competency as the "attitudes, skills, and knowledge to live and work in our multicultural and interconnected world." Direct experience with people and cultures of other nations has long been recognized as the best way to achieve global competency. In a survey of University of Kentucky (UK) pharmacy students, 75% wanted to learn about another culture. However, the barriers associated with study abroad were significant: 90.1% of students were concerned about their inability to pay the expenses associated with study abroad; 59.4% cited a lack of foreign language knowledge; and 53.1% did not want to leave their family or significant other. Therefore, a mechanism for all students to gain some of the benefits of internationalization in an accessible and affordable manner is needed. To address these problems, a Global Classroom was implemented. Students from UK link electronically through interactive video to students from Peking University Third Hospital to learn about therapeutic issues and differences and to work on related assignments and projects. Because of time and academic year differences, some portions of the course are conducted through the use of recorded videos. There are seven live sessions that are conducted via video, including presentations by student groups composed of both Chinese and American students. The third offering of this course was completed in Spring 2016. This course allows students to navigate linguistic and cultural differences, work towards common goals with persons from other cultures, work in multi-cultural teams, and gain insight about the place of each country in the world. The student begins to understand the complexity of international work, including logistics and should start to see citizens of other countries as people and not political entities. Additionally, students become comfortable operating in a virtual environment that is the reality of today's world. The Global Classroom concept has been well-received by students and faculty and will likely expand.

06-SC Abstract

International Clerkships for Pharmacy Students as a Part of Academic and Research Collaboration

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Abstract

International Clerkships for Pharmacy Students as a Part of Academic and Research Collaboration
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Since 2009, Faculty of Pharmaceutical Sciences, Chulalongkorn University (CU) has offered two programs of the 6-year Entry Level Doctor of Pharmacy. One is focused on Pharmaceutical Care and the other is on Industrial Pharmacy. Both programs require one year of general education, 4 years of pharmacy studies and one year of Professional Experiential Clerkship. The sixth year students are required to do 7 professional clerkship rotations of 6-week each. Both curricula offer 2 elective rotations on international clerkship which provides an opportunity for students to practice aboard for 12 weeks. During the 2014 academic year, 10 industrial pharmacy students have chosen to gain their clerkship experiences aboard. Three students were trained their research in drug discovery and development in USA at College of Pharmacy, University of Kentucky and Biodesign Institute, Arizona State University. Seven students rotated to Japan at the Faculty of Pharmaceutical Sciences, Chiba University, Hoshi Pharmaceutical University and Josai University for their research in drug discovery and development and cosmetic sciences. During the training, skill and behavioral performances of students were evaluated according to the assessment guideline. Students not only gained academic and scientific experiences but also had an opportunity to meet and exchange their cultures among friends from different countries. For in-bound exchanges, our faculty has served as a preceptor for pharmacy students from University of Hawaii at Hilo (USA), Auburn University (USA), Josai International University (Japan), University of San Carlos (Philippines), and University of Pharmacy, Yangon (Myanmar). We have planned to extend our international rotation program for both in-bound and out-bound to cover more students particularly for pharmaceutical care students. These exchanges through student clerkship rotations, initiated from academic and research collaborations, have proactively strengthened our partner relationship and hopefully will branch out into more countries and universities to benefit student learning and all aspects of academic and scientific network.

07-SC Abstract

Faculty of Pharmaceutical Sciences Naresuan University (NU), Phitsanulok THAILAND

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Abstract

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Faculty of Pharmaceutical Sciences, Naresuan University located in Phitsanulok a province in lower northern region of Thailand. The faculty was officially established in February 1994 as the 7th governmental school of pharmacy in Thailand. It is the first pharmacy school in the country and South East Asia to offer the Doctor of Pharmacy or Pharm.D. degree.

At present, the Faculty offers comprehensive pharmacy educational opportunity in undergraduate, graduate and professional levels through the 7 academic programs as the followings

Undergraduate Programs :

- Doctor of Pharmacy in Pharmaceutical Care
- Bachelor of Science in Cosmetic Sciences

Graduate Programs :

- Master of Pharmacy in Community Pharmacy
- Master of Science in Cosmetic Sciences.
- Master of Science in Pharmacology
- Master of Science in Pharmaceutical Chemistry and Natural Products
- Doctor of Philosophy in Pharmaceutical Sciences

Our graduate programs are in aligning with the operation of three research centers and versatile research units to move our research and graduate programs toward excellence. The examples of outstanding research units are Bioscreening Research Unit, Natural Products Research Unit, Pharmacological Research Unit, Medicinal Chemistry Research Unit, Biotechnology Research Unit and Tobacco Control Research Unit. The centers include The Center of Excellence for Environmental Health & Toxicology (EH-Tox), Cosmetics and Natural Products Research Center (CosNat), and Center of excellence for innovation in Chemistry (CEIC-NU).

To provide quality and advance pharmacy education, we have developed long standing academic exchanges relationship with academic institutions in both national and international. We have regularly at least 5 student exchanges both in-bound and out-bound a year with University of Wisconsin-Madison School of Pharmacy (USA), Harrison School of Pharmacy, Auburn University (USA), University of Franche-Comte (France), Monash University (Malaysia) and Kyushu University (Japan). We also support staff development for international training experience both research and clinical training. Furthermore, we provide full scholarship for international student to attend our graduate program. There are recently 2 foreign students from Vietnam and Indonesia. In addition, our research staff and some of our graduate students have international research collaboration through the Royal Golden Jubilee Ph.D. Program.

Finally, we as a functional unit in academic also give our priority to academic services to our community and Thai society. The faculty also supervises the University's community pharmacy that provides pharmacy services to the community and serves as a main professional training site for Pharm.D. students.

08-SC Abstract

Faculty of Pharmaceutical Sciences, Ubon Ratchathani University

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Abstract

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Faculty of Pharmaceutical Sciences, Ubon Ratchathani University (UBU) is the public pharmacy school established in 1994. The faculty is located in the northeastern part of Thailand, bordering Lao PDR and Cambodia. **Vision:** To become a leading academic pharmacy institution in ASEAN, the faculty provides academic programs with excellent knowledge and professional skills, and produce research at an international level. **Core Competencies**: 1) Integrated pharmaceutical care curriculum with a professional network for the improvement of excellent performance, especially in four major arears including cardiovascular system, oncology, psychiatry, and primary care. 2) Integrated research and development of health products from Southern Isan herbal and local wisdom. **Academic staff**: The faculty has 65 full-time academic staff with knowledge and expertise in various fields. More than 70% of academic staff gain doctoral degree or other equivalent degrees. **Programs**: There is only one undergraduate program which is a 6-year professional program - (Doctor of Pharmacy, Pharm D). In addition, there are 5 postgraduate programs as follows: 1) Master of Science Program in Health Service Management 2) Master of Science Program in Pharmaceutical Chemistry and Natural Products 3) Master of Science Program in Biopharmaceutical Sciences 4) Master of Sciences Program in Cosmetic Sciences and Health Products 5) Doctor of Philosophy in Pharmaceutical Sciences. Recently, the faculty also provides a certificate for pharmaceutical care in cancer via a short course training program. **Research**: The faculty conducts research in four major areas including 1) Pharmaceutical Chemistry and Pharmacognosy/Natural Products 2) Biopharmaceutical Sciences (Biotechnology, Pharmacology, Toxicology, Immunology, Microbiology, etc.) 3) Pharmaceutical Products and Cosmetics 4) Pharmacy Professional and Health Care **Academic Service Centers**: In response to the demands of the community, the faculty has established the following academic service units including: Community Pharmacy Practice or Drug Store (Accredited by Pharmacy Council), Drug and Health Information Unit, Water Quality Analysis Unit (ISO/IEC 17025:2005 Certified), Factory for Herbal Medicines and Health Products. In addition, the faculty has created useful databases including: Drug Identification Database, Thai Medicinal Plant Database, Thai Crude Drug Database and Thai Herbarium Database. **Activities with US**: Academic visits by US professors and student exchange programs were the main activities between us to strengthen relation and to develop Thai academic staff and students. During 2014-2015, there are visiting professors from University of Arizona, University of Maryland, West Virginia University. Also, one staff graduated in residency program from University of Florida and another one is studying at University of Arizona.

09-SC Abstract

Faculty of Pharmacy, Siam University

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Abstract

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Siam University is the first private university in Thailand offering Doctor of Pharmacy degree (Pharm. D) since 2006. Our six-year curriculum has introduced the new era of education by utilizing patient-oriented, problem-based, project-based learning, etc. Our students receive great opportunities to expose their professional experiences as early as in the second year at hospital settings. We also operate “Osoth Siam” pharmacy to provide pharmaceutical health care service for community around the university campus. Our school has continuously worked with several communities and the community health centers to perform pharmaceutical care for individuals and boost up the community quality of life through various activities of health promotion. All of these activities have been supported our students in developing their professional skills.

In addition to primary care service, our school joins with many distinguished secondary and tertiary settings in Thailand such as Taksin hospital, Burirum hospital, Pattalung hospital, Somdet Chaopraya Institute of Psychiatry, Yuwaprasat Waithayopatham Child Pediatric hospital, Bumrungrad hospital, etc. to participate in varieties of collaborations. Such activities include clinical services, clinical practices for students, clinical clerkship rotations, researches, guest speakers/lecturers and continuing educations.

Additionally, we have established the collaboration with international organizations including University of Maryland School of Pharmacy, USA, University of Hawaii, The Danial K. Inouye College of Pharmacy, USA, Faculty of Natural Science University of Graz, Austria, and Faculty of Pharmacy, Ahmad Dahlan University, Indonesia. We have provided a clerkship rotation for international students from University of Maryland School of Pharmacy since 2015. International students also visited our school for their engagement in Thai traditional medicine research. Moreover, guest lecturer from University of Graz has been annually invited in order to update research knowledge in field of natural sciences for our faculties and students.

We strongly believe that our unique educational programs in pharmaceutical care and affiliation with the organizations, hospitals, and communities would provide great opportunities for our Pharm.D. students to learn by practice in one of the best professional environment in Thailand.

10-SC Abstract

Faculty of Pharmaceutical Sciences, Khon Kaen University, Khon Kaen, THAILAND

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Abstract

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Institution and Mission: Our School is located on the serene beautiful campus of Khon Kaen University (KKU)which was established in 1964 as the major university of the Northeastern part of Thailand. The Faculty of Pharmaceutical Sciences, one of leading faculties of KKU, was established in 1980 with the primary mission is to produce professional pharmacists to serve the national demands of health care staff such as health care providers in communities (drug stores), hospitals, and industrial pharmacies . **Academic staff and divisions:** The Faculty structure comprises of 75 academic staffs in 1) Office of Academic Affair (6); 2) Division of Clinical Pharmacy (17); 3) Division of Social and Administrative Pharmacy (11); 4) Division of Pharmacognosy and Toxicology (16); 5) Division of Pharmaceutical Technology (15); 6) Division of Pharmaceutical Chemistry (10). **Programs and students:** there are *790 undergraduate students* in Bachelor of Pharmacy Program (540) and Bachelor of Pharmacy Program (English Program) (250); *179 Master degree students* in Clinical of Pharmacy (31), Pharmaceuticals (11), Pharmacy Management (59), Health Consumer Protection and Health Management (7), Pharmaceutical Chemistry and Natural Products (19), Aesthetic Sciences and Health (39), Toxicology (3), and Thai Traditional Pharmacy (10); and *32 Philosophy of Doctoral degree students* in the program of Research and Development in Pharmaceuticals (23) and Pharmacy and Health System (9). Moreover, the Diploma Courses in Pharmacotherapy has been provided**. International pharmacy internship:** As part of the pharmacy core curriculum, more than 100 students were sent oversea to have professional practice experience under supervision of quality preceptors at various institutes in different countries; in year 2015, 35 of 6th year pharmacy students had practiced in the areas of community pharmacy, clinical pharmacy and laboratory work for research in U.S.A., Portugal, Japan, Taiwan and Singapore. **International student exchange in year 2015:** There were students from University of Tennessee College of Pharmacy (USA), Western University of Health Sciences (USA), University of Washington School of Pharmacy (USA) and Keio University**,** Faculty of Pharmacy (Japan). **Scholarship for international students:** the scholarship for international students is provided by faculty and alliances for foreign students such as students from Laos and China who attend our master and graduate programs. Additionally, our research staff and some of our graduate students have international research collaborations through the Royal Golden Jubilee Ph.D. Program and other international grants. **Facilities:** to facilitate the academic, research, and community services, the Faculty includes three state-of-the-art buildings, providing of academic and information technology resources, the community pharmacy practice stores (drug stores), a holistic health center or so-called a spa, and an excellent center of herbal research, namely, Center for Research and Development of Herbal Health Products.

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