



SHAPING TOMORROW'S PRACTITIONERS TODAY
LINKING PHARMACY EDUCATION TO PRACTICE

FINAL PROGRAM AND ABSTRACT BOOK

Access the interactive conference program online at
apsa2014.sched.org/mobile

WELCOME

Dear colleagues,

On behalf of the Queensland University of Technology (QUT) Pharmacy Discipline, I would like to officially welcome you to the Australasian Pharmaceutical Sciences Association (APSA) 2014 Conference.

We take great pleasure in hosting you in Brisbane on 5-7 December, 2014 at our beautiful Queensland University of Technology Gardens Point campus – located right in the centre of our fabulous city, the campus is easily accessible by public transport and close to the river, botanical gardens, inner-city beach and our entertainment and café precinct at South Bank Parklands.

The theme of the conference this year is *"Shaping tomorrow's practitioners today – linking pharmacy education to practice"*.

In choosing this theme the committee has acknowledged and recognized the important role educators play in the development of the pharmacy professional of the future, the underpinning pharmaceutical sciences and key future pharmacy practice roles.

The organizing committee have prepared an exciting program for attendees, starting with a selection of optional pre-conference workshops on Friday (5th), followed by the main conference program on Saturday (6th) and Sunday (7th).

We will hear from overseas experts who will share their experiences around education development and practice expansion, paired with local personalities to provide insight into our evolving needs. The conference will culminate in an exciting debate about the future of the pharmacy degree qualifications currently produced in Australia and New Zealand.

Thank you for joining us for this key event on the national conference program. We hope you enjoy catching-up with your colleagues to discuss and plan for our future role in shaping tomorrows practitioners; enjoy our social events and spend some time in our beautiful city.

The QUT Pharmacy team is looking forward to seeing you all - help us shape tomorrow's practitioners today!



Professor Lisa Nissen

Chair, APSA 2014

Head, School of Clinical Sciences

Queensland University of Technology





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QUT Health

SCIENTIFIC PROGRAM AND CONFERENCE COMMITTEE

Prof Lisa Nissen (Chair)	Dr Esther Lau
Dr Trudi Collet	Mr Manuel Serrano Santos
Dr Leisa-Marie Toms	Ms Leanne Gillespie - Administrative Support
Dr Vincent Chan	Ms Stephanie Castaneda (nee Dunn) - Program
A/Prof Helen Kastrissios	



OPENING KEYNOTE

Dr Nancy Waite

Professor, School of Pharmacy, University of Waterloo;
Associate Director, Practice-Based Education and
Professional Outreach; Ontario College of Pharmacists
Professor in Pharmacy Innovation



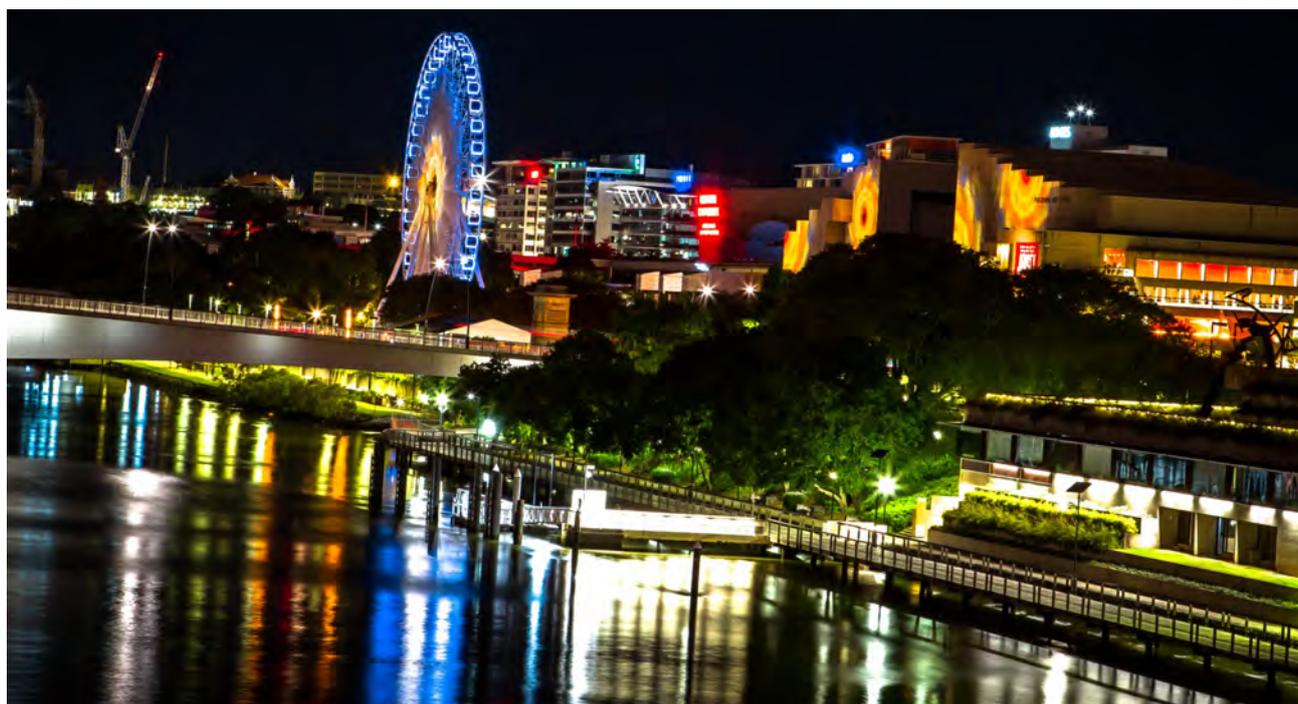
Dr Waite's research program examines the development and assessment of curricula to produce pharmacists prepared to provide medication management in an evolving healthcare landscape, as well as explores the impact of novel pharmacist interventions and pharmacist scope of practice changes on medication management and health outcomes.

She leads OPEN – the Ontario Pharmacy Research Collaboration – a new \$5.7 million provincially funded multi-institutional study to foster innovation in pharmacy practice and to evaluate the effectiveness of Ontario pharmacist-led medication management programs.

“Expanding roles for pharmacists in Canada – lessons for educators and the profession” - 101

As health care and pharmacist services change, the pharmacy profession tries to keep policy, practice, research and education aligned, current and forward thinking. Come hear the latest from the land of snow and ice regarding Canadian pharmacist scope of practice change. Details of policy, reimbursement, and whether pharmacists are implementing these services will be shared.

Research being done by Canadian researchers (including from OPEN) on the value and outcomes of these services will be presented. Hear how the Canadian educational system is changing to accommodate the new skills needed. Finally, commentary will reveal further opportunities and challenges. An open discussion at the end will act as a platform to understand applicability of the Canadian experience to the Australian experience.



PLENARY 1

Dr Ian Coombes

Director of Pharmacy, Royal Brisbane and Women's Hospital

Dr Coombes is the Director of Pharmacy at the Royal Brisbane and Women's Hospital, Vice President of the Society for Hospital Pharmacists of Australia, Adjunct Associate Professor at School of Pharmacy, University of Queensland and an APC Councillor.



Dr Coombes is a leader in the area of practitioner development for medication services. He implements processes for competency based performance training and assessment of pharmacy practitioners across Queensland. Ian's focus over several years has been on developing and evaluating prescribing training programs and systems to reduce junior doctor prescribing errors and is currently developing programs for medical and non-medical prescribing.

"A curriculum for the future – critical success and key learning's for future practitioner development" - 102

Dr Coombes will discuss the concepts of the professional needs for pharmacy, in light of the formal recognition of exciting new processes for supporting the advancement of pharmacists as clinicians, scientists, leaders, managers, educators and researchers. Pharmacists working at Advanced Practice with extended scopes of practice will soon be able to gain credentials and be formally recognised as being advanced practitioners. The process of practitioner development needs to be underpinned by our "drug expertise".



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PLENARY 2

Mark Fahey

Health Informatics Specialist



Mark Fahey is a Sydney based biomedical engineer specialising in the technologies designed to monitor at high frequency the vital signs of intensive care patients. Mark has held professional positions on most continents with a particular focus on delivering new vital signs technologies into hospitals in conflict zones and the developing world. Recent years has seen Mark return to Australia to consult on business strategy for organisations designing acute care closed-loop electronic medication management solutions. Other current interests include Satdirectory a leading consultancy service covering free-to-air satellite transmissions available from regional satellites in the Asia-Pacific Region. Satdirectory serves journalists, government, diplomats, NGO's and individuals who require access and analysis of domestic broadcast media from Asia and the Middle-East.

Satdirectory serves journalists, government, diplomats, NGO's and individuals who require access and analysis of domestic broadcast media from Asia and the Middle-East.

“Information is power – A view from behind the curtain” - 103

Clinicians are mindful that quality information can dictate patient and consumer health outcomes. However, imagine the dysfunction to society if all information was controlled and never challenged to determine its quality. Information is powerful. The success or failure of most endeavours is determined by the ability to acquire data, evaluate its quality, transform it into knowledge and the technical skills that deliver a beneficial result.

Accurate, evidence-based information provided to clinicians and consumers has produced revolutionarily health advances. However there are many examples of where poor quality health information has served special interests and hidden agendas resulting in generational health distress and suffering. Health professionals are required to be well informed, but they also need to evaluate the quality and source of information.

When information is totally controlled and not rigorously challenged or tested a national tragedy can result...

North Korea prevents its citizens from accessing any form of independent media and holds a monopoly on all information in the country. Citizens who attempt to access foreign broadcasts and seek information from the outside world risk being interned in one of the state's many prison camps.

Over four years, Mark Fahey, a Sydney based Biomedical Engineer has made successive trips into each province of North Korea. He has smuggled forbidden electronic equipment in and out to capture, monitor, record, and analyse hundreds of hours of local and regional domestic media and collect restricted domestic publications. This biased information is used by the North Korean regime as the prime instrument of control over the population. The information collected is in the final stages of editing prior to its publication in a multimedia tablet magazine/book which will be available as a free-of-charge Creative Commons licensed download in late 2014.

This session will be a fast-paced interactive audio-visual presentation of rare video, audio and still photography together with an explanation of the techniques the presenter used to successfully travel multiple times throughout North Korea and covertly gather information to expose the country's universally accepted, but distorted version of reality.

APSA Medal Presentation

Professor Jeff Hughes

Former Head of School, Curtin University
School of Pharmacy



Professor Jeff Hughes is the former Head of the School of Pharmacy, Curtin University. He graduated from the Western Australian Institute of Technology (WAIT) with a BPharm degree in 1978, since that time he has completed three postgraduate degrees including his PhD which he received in 2007.

Jeff has received a number of state and national awards for his contribution to pharmacy education, practice and research including the Pharmaceutical Society of Australia's Pharmacist of the Year award in 2004, the Eric Kirk Memorial Award in 2008 and the AACP-Pfizer Consultant Pharmacist Award in 2009.

His research interests included pharmacy education, pharmacy practice, adverse drug reactions and pharmacovigilance, and quality use of medicines. He has published over 200 research and professional papers and contributed to 17 books. Jeff is a practising accredited pharmacist and a part-owner of a community pharmacy.

"The APSA Medal Oration: Making a difference" - 104

In this presentation I would like to share with you my thoughts about making a difference. I believe everyone has the opportunity to make a difference; you just need decide who do you want to make a difference for (e.g. self, student, patient, scientific community) and what difference you want to make. Having done that you will be able to plan how you are going to go about making that difference. For example, are you going to create new knowledge or simply apply what you already know? What will be the measures of your success; how will you know if you really have made a difference? What seems simple can prove more difficult than you think, but if the intent is good, one should not be discouraged by barriers which emerge, rather seize them as opportunities in your quest to make the change you desire a reality.



PLENARY 3

Professor Ian Bates

Head of Education Development, University College
London School of Pharmacy



Ian Bates holds the Chair of Pharmacy Education at the UCL School of Pharmacy as Head of Educational Development and is a Faculty Fellow of the Royal Pharmaceutical Society.

He is seconded to the National Health Service (NHS) in London, as academic lead across the university teaching hospitals. Professor Bates is the Director of Education Development for the International Pharmaceutical Federation (FIP), leading an international team appointed by FIP working in partnership with WHO and UNESCO, and additionally Editor-in-Chief of Pharmacy Education, an international peer review research journal hosted by FIP.

He is a Fellow of the Royal Pharmaceutical Society, a Fellow of the Royal Statistical Society, a Fellow of the Royal Society for Public Health, and a Trustee for the European Pharmaceutical Students' Association. He is a Programme Director for the Joint Programmes Board, providing foundation training and workplace education for practitioner development for NHS pharmacists; additionally, as a founder member of CoDEG, provides advice on workplace education for many domestic and international institutions and agencies.

Professor Bates is the Coordinator for the FIP-UNESCO Global UNITWIN Network for Education, a transnational network spanning over 25 universities in 16 countries worldwide. He is the independent Expert Advisor for the Royal Pharmaceutical Society on educational matters and the nominated representative for Health Education England and the associated professional Advisory Board. He was appointed a Fellow of the International Pharmaceutical Federation (FIP) in 2013 in recognition of his global leadership in international education development, and additionally received the Lifetime Achievement Award from UKCPA.

"Better Training, Better Care: Why we need national strategies for workforce development" - 105

Healthcare reforms are a key government priority in many countries. Pharmacy has a part to play, particularly in relation to medicines optimization, integrated care models and patient safety. However, we cannot fulfil our clinical and pharmaceutical care obligations without ensuring we develop a competent and capable workforce.

Education and training - and the quality of workforce development support in particular - are therefore key components of healthcare reform.

This presentation will look at new ways of ensuring pharmacy workforce development at national levels, and will pay particular attention to quality driven early years training and advancement of professional clinical practice. We will link workforce reforms with patient care services and show that new ways of working, for example partnership working across sectors, will be a key component of professional development both now and in the future. Better training, better care.



APSA LECTURE

Professor Ines Krass

Professor in Pharmacy Practice, University of Sydney
Faculty of Pharmacy



Ines Krass joined the Faculty of Pharmacy at the University of Sydney as a lecturer in 1993 and is now Professor in Pharmacy Practice. In 20 years in academia, she has built a strong national and international reputation in health services research in community pharmacy evidenced by close to over 150 refereed publications, visiting professorships, invitations to speak at national and international conferences, to contribute to subject reviews and to join journal Editorial Boards.

Professor Krass has supervised 21 higher degree students to completion of their higher degree (13 PhDs, 8 Master of Pharmacy/Clinical Pharmacy students) and 15 honours students. She is currently supervising four higher degree students. Ines' research focuses on health services research in community pharmacy. This involves the development, implementation and evaluation of chronic disease care models delivered by pharmacists for asthma and diabetes; screening and prevention of diabetes, CV disease, asthma and sleep disorders and the validation of measures of pharmacist and consumer attitudes and behaviours.

Over recent years she has been intensively involved in trialling disease state management programs (DSM) in community pharmacy for type 2 diabetes and asthma. She led a national research team which published the first Australian evidence supporting the role of the community pharmacist in caring for patients with diabetes. This research has directly informed the implementation of diabetes related services in community pharmacy. Ines also has a special research interest in measurement and validation of psychometric instruments. A series of instruments to assess the attitudes, knowledge, behaviours and satisfaction of both pharmacists and consumers have been developed and validated.

"Translating evidence into community pharmacy practice: reflections of a researcher" - 106

Innovation of service delivery is critical to address the burgeoning problems of chronic disease as the population ages. Community pharmacy represents a valuable resource of trained health care professionals that should be utilised to provide preventive and chronic care services as part of an integrated primary care sector approach.

Developing and trialling models for community pharmacist delivered services in screening and disease management for CVD, asthma, and type 2 diabetes (T2DM) has been a focus of my research since the mid-1990s. In terms of prevention our research group has tested the proposition that pharmacy is a feasible site for screening for undiagnosed conditions and risk factors. The pharmacy based models for disease management have centred on self-management support provided through a series of regular visits with a credentialed pharmacist to assist people with sub optimally controlled disease. At each visit, the pharmacist tailored the consultation to the individual needs of the patient with the overall aim of empowering the patient to take better control of their condition.

A systematic program of research for the disease management models involving pilot studies, randomized controlled trials (RCT) followed by implementation trials has provided a strong evidence base for the clinical efficacy and cost effectiveness of these services. For the disease management models, educating patients about their conditions, monitoring patient progress and well as the outcomes of the interventions appeared to be the essential elements of the process. Both pharmacists and patients identified the outstanding benefits of the service and expressed great satisfaction with service provision. The many challenges in translation of these chronic disease programs from a research context into broader pharmacy practice will be a focus of this presentation.

PRE-CONFERENCE PROGRAM

Friday 5 December, 2014

08:30 - 09:00	Registration			
	P Block, Level 5			
09:00 - 10:30	Pre-conference Workshops			
Facilitators		Pharmacy Education	Pharmacist Prescribing Collaboration of Australia and New Zealand (PPCANZ)	Multidisciplinary approaches for Swallowing Difficulties
		ROOM P512	ROOM P514	ROOM P504
		Prof Ieva Stupens	Prof Lisa Nissen	Dr Esther Lau and Manuel Serrano Santos
10:30 - 11:00	Morning Tea			
11:00 - 12:30	Pre-conference Workshops			
Facilitators		Pharmacy Education	Pharmacist Prescribing Collaboration of Australia and New Zealand (PPCANZ)	Multidisciplinary approaches for Swallowing Difficulties
		ROOM P512	ROOM P514	ROOM P504
		Prof Ieva Stupens	Prof Lisa Nissen	Dr Esther Lau and Manuel Serrano Santos
12:30 - 13:30	Lunch			
13:30 - 15:30	Pre-conference Workshops			
Facilitators	CPS Heads of School Meeting (Beginning at 14:00)	Pharmacy Education	Pharmacist Prescribing Collaboration of Australia and New Zealand (PPCANZ)	Multidisciplinary approaches for Swallowing Difficulties
	ROOM U214	ROOM P512	ROOM P514	ROOM P504
	Iqbal Ramzan	Prof Ieva Stupens	Prof Lisa Nissen	Dr Esther Lau and Manuel Serrano Santos
	CPS and Pharmacy Education joint session (15:00 - 16:00) Afternoon Tea (16:00 - 16:30)			
	ROOM P512			
15:30 - 16:00	Afternoon Tea			
16:00 - 17:30	Pre-conference Workshops			
Facilitators	CPS Heads of School Meeting (Beginning at 14:00)	Pharmacy Education	Pharmacist Prescribing Collaboration of Australia and New Zealand (PPCANZ)	Multidisciplinary approaches for Swallowing Difficulties
	ROOM U214	ROOM P512	ROOM P514	ROOM P504
	Iqbal Ramzan	Prof Ieva Stupens	Prof Lisa Nissen	Dr Esther Lau and Manuel Serrano Santos
18:00 - 19:30	Welcome Reception Drinks by the "Cube" <i>Proudly sponsored by MIMS Australia</i> P Block, Level 4			 100% pure knowledge

MAIN PROGRAM

Saturday 6 December, 2014

08:00 - 08:30	Registration P Block, Level 5		
08:30 - 10:30	Keynote Speech and Plenary 1 ROOM P514 Keynote: "Expanding roles of pharmacists in Canada - lessons for educators and the profession" - 101 Dr Nancy Waite, School of Pharmacy - University of Waterloo Plenary 1: "A Curriculum for the Future – critical success and key learning's for future practitioner development" - 102 Dr Ian Coombes, Director of Pharmacy – Royal Brisbane and Women's Hospital		
10:30 - 11:00	Morning Tea and Poster Display		
11:00 - 12:30	Concurrent Sessions 1		
	Pharmacy Education 1.1	Pharmacy Practice 1.2	Drug Delivery & Pharmacometrics 1.3
	ROOM P514	ROOM P512	ROOM P505
Chairs	Mr Manuel Serrano Santos	Dr Vincent Chan	A/Prof Helen Kastrissios
Sponsors	QUT Faculty of Health	Terry White Chemists	Agilent Technologies
11:10 - 11:30	Academic performance and student engagement in a culturally and linguistically diverse (CALD) undergraduate pharmacy cohort - 110 Jacqueline Bond	The feasibility of a community pharmacy delivered in-pharmacy influenza vaccination service - 114 Chris Campbell	Silica encapsulated lipid-based colloidal carriers for reducing the food effect of Ziprasidone - 118 Tahnee Dening
11:30 - 11:50	How do final year pharmacy students understand the role of a pharmacist? - 111 Judith Burrows	Preparing Queensland Pharmacists to Vaccinate - Australian's first Pharmacists Immunisation Pilot - 115 Michelle Rosenthal	Delivering crushed tablets using thickened fluids: Is drug diffusion into gastric fluids restricted? - 119 Yady Juliana Manrique Torres
11:50 - 12:10	Potential effects of demands in academia – preliminary investigations - 112 Therese Kairuz	Australia's first Pharmacist Immunisation Pilot - who did pharmacists inject? - 116 Lisa Nissen	In vitro evaluation of nicotine release from pituri, a smokeless tobacco used by Australian aboriginals - 120 Nahid Moghbel
12:10 - 12:30	Training and support of sessional staff: A needs analysis of training requirements as James Cook University - 113 Gillian Knot	Australia's first Allied Health Prescribing Program - exploring participants understanding and confidence in clinical therapy choices for patient management - 117 Marea Patounas	Delivering crushed paracetamol tablets using thickened fluids: does it alter the pharmacokinetics? - 121 Chandramouli Radhakrishnan
12:30 - 13:30	Lunch and Poster Display <i>Proudly sponsored by the QUT Faculty of Health</i>		
			
13:30 - 15:30	Concurrent Sessions 2		
	Pharmacy Education 2.1	Pharmacy Practice 2.2	Pharmacy Practice 2.3
	ROOM P514	ROOM P512	ROOM P505
Chairs	Dr Jasmina Fejzic	Mr Manuel Serrano Santos	Ms Judith Singleton
Sponsors	QUT Faculty of Health	Terry White Chemists	Pharmaceutical Defence Limited (PDL)
13:30 - 13:50	Teaching and Assessment of Prescribing Medicines: how does Pharmacy Perform? - 122 Lynda Cardiff	Perinatal depression screening: a systematic review of its acceptability in primary healthcare settings - 128 Sarira El-Den	The impact of reducing sedatives on residents: The rational for translating sedative reduction into clinical outcomes - 134 Daniel Hoyle
13:50 - 14:10	Teaching on smoking cessation to pharmacy students in Thailand - 123 Dujrudee Chinwong	Does cigarette smoking influence the effectiveness of antidepressants in the management of depression? An exploratory study with consumers - 129 Ian Fong	Preliminary findings of the stability of Thyroxine tablets stored at room temperature - 135 Mary Madden
14:10 - 14:30	Attitudes of pharmacy students regarding pharmacotherapeutics of people with disabilities - 124 Sharon Davis	Antidepressant and Anxiolytic Medication Use Pre and Post Cyclone Yasi in North Queensland - 130 Beverley Glass	Medication Management Plans as medicine reconciliation tools: can you spot the discrepancy? - 136 Karma Mekhail
14:30 - 14:50	Evidence based education for pharmacists to improve the management of paediatric asthma - 125 Amanda Elaro	The effect of knowledge and expectations on adherence to and persistence with antidepressants - 131 Sophie Woodward	Combination analgesics containing codeine - what can pharmacists do? A Delphi study - 137 Joy Spark
14:50 - 15:10	Pharmacy students' attitudes to, and use of, traditional healthcare - 126 James Green	An Audit of Psychotropic Medication Monitoring in Australian Aged Care Facilities - 132 Christina (Yun Joo) Yang	Standardisation of over-the-counter labels using the 'Medicine Information Box' format: consumer perspectives - 138 Vivien Tong
15:10 - 15:30	Illuminating the profession's competency standards to bachelor of pharmacy students using individualised 'Traffic Light' reports - 127 Rose Nash	The experiences of stigma and discrimination from community mental health clients in NSW: a cross sectional study - 133 Jing Ye	Pharmacists translating evidence into practice: Expansion of the Reducing Use of Sedatives (RedUse) project to Australian Aged Care homes - 139 Juanita Westbury

15:30 - 16:00	Afternoon Tea and Poster Display	
16:00 - 18:00	Plenary 2 and APSA Medal Presentation	
	ROOM P514	
	Plenary 2 "Information is power - a view from behind the curtain" - 103 Mark Fahey, Health Informatics Specialist	
	APSA Medal Oration: "Making a Difference" - 104 Prof Jeff Hughes, Former Head of Pharmacy - Curtin University	
18:00 - 20:00	Cocktail Reception - "Building Social Networks" <i>Proudly Sponsored by The Pharmaceutical Society of Australia (PSA)</i> Botanic Bar, Level 4, P Block, QUT Gardens Point	 Pharmaceutical Society of Australia
Onwards	Dine around selected restaurants	

Sunday 7 December, 2014

08:00 - 08:30	Registration		
	P Block, Level 5		
08:00 - 08:30	APSA AGM		
	ROOM P512		
08:30 - 10:30	Plenary 3 and APSA Lecture		
	ROOM P514		
	Plenary 3: "The never ending story of practitioner development – training needs for pharmacists" - 105 Prof Ian Bates, Head of Education Development - University College London		
	APSA Lecture: "Translating Evidence into Community Pharmacy Practice: reflections of a researcher." - 106 Prof Ines Krass, Professor of Pharmacy Practice - University of Sydney		
10:30 - 11:00	Morning Tea and Poster Display		
11:00 - 12:30	Concurrent Sessions 3		
	Pharmacy Education 3.1	Pharmacy Practice 3.2	Pharmacy Practice 3.3
	ROOM P514	ROOM P512	ROOM P505
Chairs	Ms Jacqueline Bond	Dr Jasmina Fejzic	Ms Judith Singleton
Sponsors	Pharmaceutical Defence Limited (PDL)	NPS Medicine Wise	Therapeutic Guidelines
11:10 - 11:30	Development of a benchmarking tool for pharmacy students using threshold learning outcomes - 140 Leanne Chalmers	Pharmacists' professional use of social media - 144 Arcelio Benetoli	Primary care pharmacists and paediatric asthma management: A parent/carer's perspective - 148 Amanda Elaro
11:30 - 11:50	Pharmacist Orientation to Rural and Remote Practice: How are we doing? - 141 Pascale Dettwiller	Patient preferences for pharmacist attire: Can pharmacists dispense with the white coat? - 145 James Green	Quality use of respiratory medications in people with cognitive impairment - 149 Sharon Davis
11:50 - 12:10	Interdisciplinary learning and teaching at the Remote Health Experience (FNT): where are we at in 2014, four years later? - 142 Pascale Dettwiller	Australian community pharmacists' knowledge and practice in supporting the management of cardiovascular disease - 146 Hanni Puspitasari	Medication use in children: what do consumers really want to know? - 150 Treasure McGuire
12:10 - 12:30	Simulated learning from the classroom to pharmacy placements - 143 James Townshend	Comparing perceptions and work values of early career metropolitan and rural pharmacists in Victoria - 147 Lauren Conroy	Pharmacist attitudes and behaviours surrounding the management of paediatric asthma - 151 Amanda Elaro
12:30 - 13:30	Lunch and Poster Display		
13:30 - 15:30	Concurrent Sessions 4		
	Pharmacy Practice 4.1	Pharmacy Practice 4.2	Drug Delivery & Pharmacometrics 4.3
	ROOM P514	ROOM P512	ROOM P505
Chairs	Dr Trudi Collet	Dr Vincent Chan	Dr Sussan Ghassabian
Sponsors	National Alliance for Pharmacy Education (NAPE)	NPS Medicine Wise	Agilent Technologies
13:30 - 13:50	Measuring patients' subjective experiences of living with medicines - 152 Maria Gladys Bulanadi	What drives prescription medicine sharing among patients? A qualitative study of healthcare professionals' perspective using COM-B analysis framework - 157 Kebede Beyene	Transactivation-dependent GPCR Signalling in cardiovascular disease - 162 Peter Little
13:50 - 14:10	Pharmacy, professional responsibility and complementary medicine - 153 Adam La Caze	Withdrawn	Investigation of compounds in Carica Papaya Leaf extracts with cytotoxic activity on human squamous cell carcinoma cells using liquid chromatography-quadrupole time-of-flight-mass spectrometry - 163 Thao Nguyen
14:10 - 14:30	Turning the Heat up on Admissions: A Study of the Impacts of Extreme Heat Events on Tasmanian Hospital Admissions 2003-2010 - 154 Judith Singleton	Prescribing patterns of Novel Oral Anticoagulants at a referral hospital - 158 Natalie Raffoul	Investigation of polycaprolactone matrices for the sustained intravaginal delivery of proteins - 164 Meenakshi Pathok
14:30 - 14:50	Complementary and alternative medicine use by patients receiving chemotherapy - 155 Peter Smith	Perception and attitude towards type 2 diabetes and its medication(s)- a qualitative study in diabetic patients of Nepalese origin - 159 Sujata Sapkota	Therapeutic potential of tea tree oil for scabies: A review - 165 Jackson Thomas
14:50 - 15:10	Withdrawn	Service user priorities for people with chronic conditions, and carers: a comparison with pharmacy staff - 160 Sara McMillan	Development of nicotine-loaded chitosan nanoparticles for pulmonary delivery from dry powder inhaler formulation - 166 Hui Wang
15:10 - 15:30	Onychomycosis in the Northern Territory an omnibus survey - 156 Jackson Thomas	A discrete choice experiment to elicit preferences of consumers with chronic conditions and carers for the delimiters of community pharmacy services - 161 Jennifer Whitty	High-throughput assay for simultaneous quantification of the plasma concentrations of thiopental and pentobarbital using automated solid phase extraction coupled to LC-MS/MS - 167 Sussan Ghassabian

15:30 - 16:00	Afternoon Tea and Poster Display
16:00 - 17:00	Panel Discussion
	ROOM P514
	<i>"To the PharmD and Beyond – the future of Pharmacy Education?"</i>
Moderator	Prof Andrew McLachlan
Panel	<p>Prof Beverley Glass - James Cook University</p> <p>Ms Maree Jensen - University of Auckland</p> <p>Mr Sam Turner - National Pharmacy Students Association</p> <p>Mrs Rhonda White - White Retail Group</p> <p>Prof Nancy Waite - University of Waterloo, Canada</p>
17:00 - 17:30	Closing Comments and Awards
	ROOM P514

POSTER PRESENTATIONS

Saturday 6 December, 2014

Title	Presenter	Poster No.
Solubility studies of ibuprofen in aqueous ethanol co-solvents at high water contents	Afrina Afrose	P168
Enhanced solubility and dissolution rate of gatifloxacin by solid dispersion technique	Raida Al-Kassas	P169
Preparing community pharmacists for a role in mental health: an evaluation of accredited Australian pharmacy programs	Amary Mey	P170
Recognition of an advanced pharmacist practitioner – Lifelong learning journey	Rachel Adkins	P171
Exploring access to medicines and pharmacy services for resettled refugees	Kim Bellamy	P172
Distal limb wound healing in horses - is there a role for topical compounds?	Selena Boyd	P173
Comparison of self-reported medicine use with the pharmaceutical claims database in patient with osteoarthritis	Rhiannon Braund	P174
Exploring the perceptions of Clinical Pharmacists and Junior Medical Officers on the use of the MedMAP form as a documentation tool for adherence assessment	Tien Bui	P175
Multi-disciplinary management of metabolic risk in community-dwelling mental health patients	Lynne Emmerton	P176
Formulation and evaluation of spiramycin in pharmaceutical dosage forms	Rose Estafanos	P177
Teaching of Pharmacogenomics in Australian Pharmacy Schools	Vijay Suppiah	P178
Development of a questionnaire to measure consumers' perceptions of service quality in community pharmacies	Jenny Chen	P179
"Don't be a sooky la-la" – How are health issues managed in Western Australia's mining sites?	Lynne Emmerton	P180
Engagement of community pharmacies in a multi-centre education-focussed intervention	Lynne Emmerton	P181
Formulation and stability of oral liquids – an evolving research and skill base in compounding	Alison Haywood	P182
Increasing the sensitivity of LC-MS-MS analysis of vitamin D and its metabolites	Amitha Hewavitharana	P183
Research in hospital pharmacy: An analysis of stakeholders' needs	Andrew Campbell	P184
Synthesis and characterisation of sterically hindered pyridine based trinuclear platinum anticancer complexes and their cytotoxicity	Michael Apps	P185

POSTER PRESENTATIONS

Sunday 7 December, 2014

Title	Presenter	Poster No.
Anti-cancer effect of Carica papaya leaf juice on Colon cancer cells following in vitro digestion	Saurabh Pandey	P188
Delivering crushed paracetamol tablets using thickened fluids: Using in vitro-in vivo correlation (IVIVC) to make predictions from dissolution tests	Chandramouli Radhakrishnan	P189
Application of privacy and confidentiality in community pharmacies: Pharmacists' perceptions	Lynne Emmerton	P190
Pharmacists' willingness to conduct rapid HIV testing in community pharmacies	Ines Krass	P191
Medication related burden and patient lived experience with medicine - understanding patient's daily life and practical implications: A systematic review	Mohammed Mohammed	P192
Amber teething necklaces - medical marvel or maternal myth?	Michael Nissen	P193
An Algorithm of Medication Review in Residential Aged Care Facilities: Focus on Minimizing Use of High Risk Medications	Arjun Poudel	P194
Prevalence of swallowing difficulties and medication modification in customers of community pharmacists	Lisa Nissen	P195
Online Health Information vs Consumers' Navigational Needs	Kenneth Lee	P196
Are pharmacists prepared to work in private general practice clinics in Malaysia?	Lisa Nissen on behalf of Pui San Saw	P197
Inappropriate Formulation Choices in the Administration of Medication to Elderly Patients with Dysphagia in Nursing Homes	Jose Manuel Serrano-Santos	P198
Evaluation of a patient cam-with-chemotherapy educational brochure	Peter Smith	P199
An exploratory pilot study assessing the role of community pharmacists as oral health advisors	Meng-Wong Taing	P200
Stability of Warfarin tablets repackaged in dose administration aids	Peter Little on behalf of Thilini Thrimawithana	P201
How can we optimise medicine dollars in the high cost/low volume setting?	Lisa Nissen on behalf of Jessica Toleman	P202
What is the acceptable level of compliance with treat to target strategy when treating early rheumatoid arthritis to remission or low disease activity?	Nasir Wabe	P203
Montmorillonite Clay as a Platinum Anticancer Drug Delivery Vehicle	Michael Apps	P204

EXPANDING ROLES FOR PHARMACISTS IN CANADA – LESSONS FOR EDUCATORS AND THE PROFESSION

Nancy Waite

School of Pharmacy, University of Waterloo, Canada

As health care and pharmacist services change, the pharmacy profession tries to keep policy, practice, research and education aligned, current and forward thinking.

Come hear the latest from the land of snow and ice regarding Canadian pharmacist scope of practice change. Details of policy, reimbursement, and whether pharmacists are implementing these services will be shared.

Research being done by Canadian researchers (including from OPEN) on the value and outcomes of these services will be presented. Hear how the Canadian educational system is changing to accommodate the new skills needed.

Finally, commentary will reveal further opportunities and challenges. An open discussion at the end will act as a platform to understand applicability of the Canadian experience to the Australian experience.

A CURRICULUM FOR THE FUTURE – CRITICAL SUCCESS AND KEY LEARNING'S FOR FUTURE PRACTITIONER DEVELOPMENT

Ian Coombes

Director of Pharmacy, Royal Brisbane & Women's Hospital, Brisbane, QLD

Ian will discuss the concepts of the professional needs for pharmacy, in light of the formal recognition of exciting new processes for supporting the advancement of pharmacists as clinicians, scientists, leaders, managers, educators and researchers.

Pharmacists working at Advanced Practice with extended scopes of practice will soon be able to gain credentials and be formally recognised as being advanced practitioners. The process of practitioner development needs to be underpinned by our "drug expertise".

INFORMATION IS POWER – A VIEW FROM BEHIND THE CURTAIN

Mark Fahey

Health Informatics Specialist

Clinicians are mindful that quality information can dictate patient and consumer health outcomes.

However, imagine the dysfunction to society if all information was controlled and never challenged to determine its quality.

Information is powerful. The success or failure of most endeavours is determined by the ability to acquire data, evaluate its quality, transform it into knowledge and the technical skills that deliver a beneficial result.

Accurate, evidence-based information provided to clinicians and consumers has produced revolutionarily health advances. However there are many examples of where poor quality health information has served special interests and hidden agendas resulting in generational health distress and suffering. Health professionals are required to be well informed, but they also need to evaluate the quality and source of information.

When information is totally controlled and not rigorously challenged or tested a national tragedy can result...

North Korea prevents its citizens from accessing any form of independent media and holds a monopoly on all information in the country. Citizens who attempt to access foreign broadcasts and seek information from the outside world risk being interned in one of the state's many prison camps.

Over four years, Mark Fahey, a Sydney based Biomedical Engineer has made successive trips into each province of North Korea. He has smuggled forbidden electronic equipment in and out to capture, monitor, record, and analyse hundreds of hours of local and regional domestic media and collect restricted domestic publications. This biased information is used by the North Korean regime as the prime instrument of control over the population. The information collected is in the final stages of editing prior to its publication in a multimedia tablet magazine/book which will be available as a free-of-charge Creative Commons licensed download in late 2014.

This session will be a fast-paced interactive audio-visual presentation of rare video, audio and still photography together with an explanation of the techniques the presenter used to successfully travel multiple times throughout North Korea and covertly gather information to expose the country's universally accepted, but distorted version of reality.

THE APSA MEDAL ORATION: MAKING A DIFFERENCE

Jeff Hughes

Former Head of Pharmacy, Curtin University, Perth, Western Australia

In this presentation I would like to share with you my thoughts about making a difference. I believe everyone has the opportunity to make a difference; you just need decide who do you want to make a difference for (e.g. self, student, patient, scientific community) and what difference you want to make. Having done that you will be able to plan how you are going to go about making that difference. For example, are you going to create new knowledge or simply apply what you already know? What will be the measures of your success; how will you know if you really have made a difference? What seems simple can prove more difficult than you think, but if the intent is good, one should not be discouraged by barriers which emerge, rather seize them as opportunities in your quest to make the change you desire a reality.

BETTER TRAINING, BETTER CARE: WHY WE NEED NATIONAL STRATEGIES FOR WORKFORCE DEVELOPMENT

Ian Bates

Head of Education Development, UCL School of Pharmacy

Healthcare reforms are a key government priority in many countries. Pharmacy has a part to play, particularly in relation to medicines optimization, integrated care models and patient safety. However, we cannot fulfil our clinical and pharmaceutical care obligations without ensuring we develop a competent and capable workforce. Education and training - and the quality of workforce development support in particular - are therefore key components of healthcare reform. This presentation will look at new ways of ensuring pharmacy workforce development at national levels, and will pay particular attention to quality driven early years training and advancement of professional clinical practice. We will link workforce reforms with patient care services and show that new ways of working, for example partnership working across sectors, will be a key component of professional development both now and in the future. Better training, better care.

TRANSLATING EVIDENCE INTO COMMUNITY PHARMACY PRACTICE: REFLECTIONS OF A RESEARCHER

Ines Krass

Faculty of Pharmacy, University of Sydney, NSW

Innovation of service delivery is critical to address the burgeoning problems of chronic disease as the population ages. Community pharmacy represents a valuable resource of trained health care professionals that should be utilised to provide preventive and chronic care services as part of an integrated primary care sector approach.

Developing and trialing models for community pharmacist delivered services in screening and disease management for CVD, asthma, and type 2 diabetes (T2DM) has been a focus of my research since the mid-1990s. In terms of prevention our research group has tested the proposition that pharmacy is a feasible site for screening for undiagnosed conditions and risk factors. The pharmacy based models for disease management have centred on self-management support provided through a series of regular visits with a credentialed pharmacist to assist people with sub optimally controlled disease. At each visit, the pharmacist tailored the consultation to the individual needs of the patient with the overall aim of empowering the patient to take better control of their condition.

A systematic program of research for the disease management models involving pilot studies, randomized controlled trials (RCT) followed by implementation trials has provided a strong evidence base for the clinical efficacy and cost effectiveness of these services. For the disease management models, educating patients about their conditions, monitoring patient progress and well as the outcomes of the interventions appeared to be the essential elements of the process. Both pharmacists and patients identified the outstanding benefits of the service and expressed great satisfaction with service provision.

The many challenges in translation of these chronic disease programs from a research context into broader pharmacy practice will be a focus of this presentation.

Academic performance and student engagement in a culturally and linguistically diverse (CALD) undergraduate pharmacy cohort

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RATIONALE

While the UQ BPharm cohort has always included CALD domestic students, political and economic forces in the past decade have driven changes in higher education resulting in increased numbers of international students at many Australian pharmacy schools. While some anecdotal concerns have been raised concerning the academic performance of CALD students, few studies have appeared in the worldwide pharmacy education literature.

AIM

To determine how undergraduate CALD pharmacy students at one research-intensive Australian university perform academically relative to their non-CALD counterparts.

METHODS

This retrospective cohort study utilised secondary data from the institutional records system. Participants were a census of all students (n=1546) who graduated between 2001 - 2010. Academic performance was determined by cumulative GPA. Assignment to demographic sub-groups was based on enrolment status, language spoken at home and birth country.

RESULTS

“CALD international” students comprised 9.1%, “CALD domestic” students 38.4% and “non-CALD domestic” students 52.5% of the cohort. The main languages spoken at home, other than English, were Chinese and Vietnamese. One-way ANOVA identified academic performance of the three sub-groups was statistically different ($p < 0.001$) with CALD international students performing worst overall and non-CALD domestic students best. However, inter-individual variation within each category was evident.

DISCUSSION

Our findings confirm that cultural and linguistic diversity impacts upon academic success. Achievement is also known to be affected by the degree to which students participate in educationally effective practices, or are ‘engaged’. Therefore, a follow-up qualitative study is underway to explore the influences on student engagement and academic success in our intercultural context.

How Do Final Year Pharmacy Students Understand The Role Of A Pharmacist?

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METHOD

Of a cohort of 252 final year pharmacy students, 104 (41%) completed two open-ended questions relating to pharmacy practice as part of an online survey, just prior to graduation. Data were analysed using a phenomenological approach.

RESULTS

Despite all students completing the same undergraduate program, they understood the role of a pharmacist in a variety of ways. Students understood pharmacy practice as: (1) dispensing and/ or providing counselling, information and advice; (2) communicating effectively about medicines, usually to ensure understanding; (3) gathering information to review medicines for ensuring safety and appropriateness, intervening if needed; (4) identifying and solving medication related problems; (5) caring for individuals' medication and health related needs; and (6) providing an accessible healthcare service to all members of the community as part of a healthcare team.

Category 1 was the most common understanding in 33% of students, aligning with traditional roles of pharmacists. The remaining understandings progressively broaden, with a distribution of 11 to 14% of students in each group.

DISCUSSION

While not all graduates will have an identical understanding of pharmacy practice, pharmacy educators must consider and address the variation in how students understand what it is to be a pharmacist in the modern healthcare system. This is necessary to ensure that understandings align with program goals, the vision for the profession and health care reform agendas. The development of broad understandings may allow more graduates to embrace practice opportunities that extend beyond dispensing and counselling, to optimise patient care and to secure the future of pharmacy.

Potential effects of demands in academia – preliminary investigations

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METHODS

The aim was to compile a descriptive overview of stressful demands in academia. A diverse range of international literature (<10 years) was reviewed to explore expectations and responsibilities of academics in the context of effects that could adversely impact on critical and creative thinking required of university academics. Papers were reviewed based on the question “*What are current expectations and demands in academia?*” This preliminary exploratory phase was supplemented with personal observations and informative discussions.

RESULTS

In addition to demands of preparing and delivering undergraduate and postgraduate learning materials for increasing numbers of students, academics cope with rapid advances in technology, increasing administrative demands, challenges and responsibilities associated with culturally and linguistically diverse students, and an increasingly competitive funding environment. ‘Evidence’ of teaching quality is based on non-validated instruments and unrepresentative samples yet may be used to calculate teaching scores; research productivity is based on quantifiable metrics many of which favour one research type. A managerialist approach, increasing bureaucracy and a premise of quantity pervade the reviewed literature.

DISCUSSION

Primarily non-quantifiable qualities and attributes of academics lie at the core of effective learning, teaching, research and governance. Competing expectations and demands are complex and are compounded by the intrinsic motivators that drive many academics. Performance measures often do not reflect demands, while mentoring, duty of care, motivation, and enthusiasm are expected and essential characteristics of academics. It is suggested that flexible performance measures and innovative human resource management systems may shift the focus from competitive management to motivational leadership.

Training and support of sessional staff: a needs analysis of training requirements at James Cook University

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²Faculty of Health Sciences and Medicine, Bond University, Gold Coast, Australia

Sessional staff have increasingly been involved in teaching at universities, playing a pivotal role in bridging the gap between theory and practice, particularly for students in the health professions. However, the training and support of these staff, referred to in pharmacy as tutors, has often been neglected.

METHODS: To inform the design of the training program, a needs analysis study was conducted involving a pharmacist tutor questionnaire to all past, present and potential pharmacist tutors at JCU. This was followed by a series of focus groups involving pharmacist tutors, academic staff and students. Evaluation of this data used both qualitative thematic analysis and quantitative methods to investigate the role of the tutor, experiences with or as tutors, the benefits of training and training requirements.

RESULTS: Tutor feedback indicated that there was a need for training and that a pharmacy-specific training program had significant benefits over a generic university-wide program. The most important role for pharmacist tutors was identified as the linking of theory to the practice which is thought to assist in maintaining currency of the Pharmacy curriculum and in the development of professionalism. In order to adequately undertake and fulfil this role, tutors identified several important areas of training, included teaching communication skills, providing student feedback and appropriate assessment and marking.

DISCUSSION: This study has provided a valuable insight into the training and support requirements of pharmacist tutors at JCU and created a sound base from which to design an appropriate pharmacy-specific tutor training program.

The feasibility of a community pharmacy delivered in-pharmacy influenza vaccination service

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BACKGROUND

Pharmacist-administered vaccination is a reality in many countries including USA, Canada, UK, Portugal, Ireland and New Zealand. In Australia the role of pharmacist administered vaccination has long been supported by the profession particularly the Pharmaceutical Society of Australia and Pharmacy Guild of Australia, however legislation prohibits this practice in each state and territory. In 2013 the only available in-pharmacy vaccination services are those delivered by an immunization nurse, nurse practitioner or general practitioner.

METHOD

Using a nurse practitioner and immunisation nurse model, pharmacies across the Terry White Chemist group participated in an influenza vaccination program during April and May 2013. Each pharmacy was allocated at least one 3 hour session with allowances for multiple sessions depending on nurse availability, pharmacy preparedness and projected patient demand. Patients were asked to evaluate the service during the 15 minute observation period after vaccination.

RESULTS

16574 patients were vaccinated over 226 sessions in 150 Terry White Chemists pharmacies. Evaluation surveys were completed by 2690 patients. 78% of respondents indicated they will return next "flu" season and 90% indicated they would be comfortable with pharmacist-administered vaccination

DISCUSSION

The results suggest not only are patients comfortable with receiving vaccinations in the community pharmacy setting, the vast majority surveyed would feel comfortable with vaccinations being pharmacist-administered. The addition of immunisation as a pharmacist-led professional service should be investigated in the Australian setting.

Preparing Queensland Pharmacists to Vaccinate – Australia’s first Pharmacists Immunisation Pilot

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BACKGROUND

In November 2013, the Queensland Department of Health announced its intention to pilot pharmacists vaccination for influenza in the 2014 Flu season. The Pharmaceutical Society of Australia Queensland Branch was tasked with development of an appropriate training program for the pilot.

AIM

To develop, implement and evaluate a training program for pharmacist vaccination relevant to Australian Pharmacist needs.

METHOD

Two online content Modules were delivered to participants followed by a compulsory MCQ test. A face-to-face workshop was then undertaken including practical injection skills and anaphylaxis management. Participants were also required to have a current First-Aid and CPR certificate and to complete the ASCIA anaphylaxis e-training for pharmacists. Face-to-face training was delivered using the same qualified trainer to ensure consistency in skill delivery. Pharmacists were asked to evaluate the training program at the completion of the course.

RESULTS

157 pharmacists across Queensland completed the training. Participants rated the training highly on a 5-point likert scale (>4.4 for all fields) for relevance to practice, comfort with the skill, confidence to do the task and relevance of the learning objectives to the training. Qualitative feedback indicated that a key component of the training was the ability to practice injections on each other.

CONCLUSION

The results indicated participants felt prepared for vaccination following completion of the training program. This was reflected in the high level of confidence reported. However, follow-up post-pilot will be required to see if this confidence was translated into practice during the implementation phase.

Australia's first Pharmacist Immunisation Pilot - who did pharmacists inject?

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BACKGROUND

The Queensland Pharmacist Immunisation Pilot is Australia's first to allow pharmacists vaccination. The pilot ran between April 1st 2014 and August 31st 2014, with pharmacists administering influenza vaccination during the flu season.

METHODS

Participant demographics and previous influenza vaccination experiences were recorded using *GuildCare* software. Participants also completed a 'post-vaccination satisfaction survey' following their influenza vaccination.

RESULTS

A total of 11,475 participant records were analysed. Females accounted for 63% of participants, with the majority of participants aged between 45 – 64 years (53%). Overall, 49% of participants had been vaccinated before, the majority at a GP clinic (60%). Most participants reported receiving their previous influenza vaccination from a nurse (61%). Interestingly, 1% thought a pharmacist had administered their previous vaccination, while 7% were unsure which health professional had administer it. It was also of note that approximately 10% of all participants were eligible to receive a free vaccination from the National Immunisation Program, but still opted to receive their vaccine in a pharmacy.

Over 8,000 participants took part in the post-vaccination survey, 93% were happy to receive their vaccination from a pharmacy in the future while 94% would recommend this service to other people. The remaining 7% and 6% respectively had omitted to fill in those questions.

DISCUSSION

Participants were overwhelmingly positive in their response to the pharmacist vaccination pilot. These findings have helped pave the way for expanding the scope of practice for pharmacists with the aim to increase vaccination rates across the state.

Australia's first Allied Health Prescribing Program – exploring participants understanding and confidence in clinical therapy choices for patient management

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BACKGROUND

Globally there are emerging trends for non-medical health professionals to expand their scope of practice into prescribing. The NPS Prescribing Competencies Framework and the Health Professionals Prescribing Pathway Program are recent initiatives to assist with implementation of prescribing for allied health professionals (AHPs).

For AHPs to become prescribers, training programmes must be designed to extend their knowledge of medicines information and medicine management principles with the aim of optimising medicines related outcomes for patients.

AIM

To explore the understanding and confidence in clinical therapeutic choices for patient management of those AHPs enrolled in the *Allied Health Prescribing Training Program Module One: Introduction to clinical therapeutics for prescribers*, delivered by Queensland University of Technology, Brisbane.

METHOD

A pre-post survey was developed to explore key themes around understanding and confidence in selecting therapeutic choices for patients with varying complexities of conditions. Data were collected from participants in week one and 13 of the module via an online survey using a five-point Likert scale (1 = Strongly Agree (SA) to 5 = Strongly Disagree (SD)).

RESULTS

In the pre-Module survey the AHPs had a limited degree (D/SD) of understanding and confidence regarding the safe and effective use of medicines and appropriate therapeutic choices for managing patients, particularly with complex patients. This improved significantly in the post Module survey (A/SA).

CONCLUSION

Targeted training of AHPs in clinical therapeutics for prescribing can improve understanding and confidence around drug therapy choices and will enable quality use of medicines for patients.

Silica encapsulated lipid-based colloidal carriers for reducing the food effect of Ziprasidone

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Ziprasidone is an atypical antipsychotic drug which demonstrates poor oral absorption and a clinically significant “food effect”, whereby bioavailability is enhanced two-fold when administered postprandially. As such, ziprasidone is prescribed to be co-administered with food [1]. On this basis, ziprasidone may benefit from reformulation as lipid-based colloidal carriers (LBCC), which have the ability to enhance fasted-state dissolution and bioavailability by mimicking the food effect.

METHODS

Self-nanoemulsifying drug delivery systems (SNEDDS) were developed for ziprasidone. Solid-SNEDDS and novel silica-lipid hybrid (SLH) microparticle formulations were prepared in a two-step process: sonication and overnight stirring of SNEDDS/emulsions, followed by spray-drying of precursor SNEDDS/emulsions stabilised by silica nanoparticles. *In vitro* lipolysis studies were conducted under simulated fed/fasted state intestinal conditions using a previously established method [2]. Formulation samples were subjected to *in vitro* digestion, and drug solubilisation in the aqueous phase was determined via HPLC.

RESULTS

Pure ziprasidone exhibited the lowest rate and extent of dissolution, in addition to showing a significant food effect (2.7-fold increase in dissolution under fed-state conditions). SNEDDS and solid-SNEDDS significantly enhanced the fasted-state dissolution of ziprasidone (32-37% vs. 1% after 60 minutes), and reduced the food effect (1.2-fold increase under fed-state conditions for SNEDDS/solid-SNEDDS).

DISCUSSION

The current data verify the hypothesis that LBCC can reduce the food effect for ziprasidone, thereby potentially enhancing the efficacy of this drug when administered orally in the fasted-state. Solid-SNEDDS were able to preserve the *in vitro* performance of SNEDDS, whilst offering the potential advantage of enhanced physicochemical stability.

REFERENCES

- [1] Miceli et al. *Psychopharm Bull*, **2007**, 40, 58-68.
- [2] Sek et al. *J Pharm Pharmacol*, **2002**, 54, 29-41.

Fig. 1 Dissolution profiles of ziprasidone (equivalent to 2 mg) under simulated fed/fasted state intestinal conditions

Delivering crushed tablets using thickened fluids: is drug diffusion into gastric fluids restricted?

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Solid medications are often crushed and mixed with food or thickened water to aid drug delivery for those who cannot or prefer not to swallow whole tablets or capsules. Dysphagic patients have the added problem of being unable to safely swallow thin fluids so water thickened with polysaccharides is used to deliver crushed medications and ensure safe swallowing. It is postulated that these polysaccharide systems may restrict drug release by reducing the diffusion of the drug into gastric fluids.

METHODS

By using a vertical diffusion cell separated with a synthetic membrane, the diffusion of a model drug (atenolol) was studied from a donor system containing the drug dispersed into thickened water with xanthan gum (concentration range from 0.005%-2.2%) into a receptor system containing simulated gastric fluid (SGF) at 37°C. The amount of drug transferred was measured over 8 hours and diffusion coefficients estimated using the Higuchi model approach.

RESULTS

Atenolol diffusion decreased with increasing xanthan gum concentration up to 1.0%, above which diffusion remained around $300 \mu^2\text{s}^{-1}$. The rheological measurements captured the influence of the structure and conformation of the polysaccharide in water on the movement and availability of the drug in SGF.

DISCUSSION

Dose form administration for dysphagic patients' needs special attention from general practitioners, pharmacist and patients. Improving drug release of crushed tablets from thickening agents requires a reduction in the diffusion pathway (e.g. by decreasing drop size radius). This approach could make the drug available in SGF in a short time without compromising the mechanical aspects of thickening agents that guarantee safe swallowing.

***In vitro* evaluation of nicotine release from pituri, a smokeless tobacco used by Australian aboriginals**

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Aboriginal populations of Central Australia chew pituri, which is prepared from native tobacco plants. The dried tobacco leaves are dipped into wood ash, mainly from acacia or eucalyptus trees, and the mixture is chewed to form a 'quid'; this is then chewed, and held or stored within the mouth or on the body for extended absorption of nicotine. This study investigated the release of nicotine from pituri.

METHODS

Dried leaves of an Australian wild tobacco, *Nicotiana gossei*, were mixed with artificial saliva with or without the ash from *Eucalyptus coolabah* twigs. Nicotine standard was also mixed with the saliva as the control. Each mixture was pressed with a glass rod to mimic mastication and form the quid, and then placed in the donor chambers of vertical diffusion cells with a dialysis membranes between the donor and the receptor cells. Isotonic phosphate buffer solution (pH 7.4) at 37°C was used as the receptor medium. Samples were withdrawn from the receptor cells at different time points and analysed by HPLC-UV. The pH of the ash in water was determined.

RESULTS

The ash was very alkaline in pH. The concentration of nicotine measured in the receptor cell increased faster and to a higher level from the mixture of leaves with ash compared with the leaves alone.

DISCUSSION

This work confirms experimentally what has been suggested in the literature to occur as a result of mixing ash with tobacco leaves. The ash makes the saliva more alkaline, which decreases nicotine ionisation, and consequently increases permeation through cell membranes.

Delivering crushed paracetamol tablets using thickened fluids: does it alter the pharmacokinetics?

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Dysphagia, often associated with conditions such as stroke, Parkinson's disease, multiple sclerosis, and dementia, causes patients to have difficulty with swallowing food and/or liquids. These patients require their fluids to be thickened using gum-based thickening powders in order to facilitate safe swallowing. These thickened fluids are also used as a vehicle for delivery of crushed medicines. Our in vitro measurements suggest that thickened fluids can delay and reduce the dissolution of a number of medications. This study was conducted to assess the impact of the use of thickened fluids on the clinical pharmacokinetics of oral paracetamol.

METHODS

20 Healthy volunteers were administered a single oral dose (1g) of paracetamol as either whole tablets, crushed with water, crushed with semi-solid jam, or crushed with thickened fluid according to a randomised, crossover design. Saliva samples were collected periodically over 8 hr and paracetamol concentration analysed by HPLC-UV. Non-compartmental pharmacokinetic analysis was conducted using Winnonlin®.

RESULTS

The mean peak concentration (C_{max}) of paracetamol ranged between 5.62 – 8.00 µg/mL. Comparison between the crushed paracetamol with thickened water (Level 900) and other treatment options (whole, crushed with water, and crushed with jam) showed there was a significant difference in C_{max} at 90% CI (p < 0.05). Also, whole tablet had a significant difference in C_{max} between crushed with water and crushed with jam. There was no significant difference in AUC irrespective of the treatment.

DISCUSSION

The use of thickened water resulted in alteration in the absorption kinetics of paracetamol. Given this interaction, co-administration with thickened fluids may have important clinical implications for medications with a narrow therapeutic index.

Teaching and Assessment of Prescribing Medicines: how does Pharmacy Perform?

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BACKGROUND

Prescribing is a complex task, requiring specific knowledge and skills combined with effective, context-specific clinical reasoning. Prescribing errors can result in significant morbidity and mortality. For all professions with prescribing rights, a clear need exists to ensure students graduate with a well-defined set of prescribing skills, which will contribute to competent prescribing.

AIM

To describe the methods employed to teach and assess the principles of effective prescribing across five non-medical professions at Queensland University of Technology.

METHOD

The NPS National Prescribing Competencies Framework (PCF) was used as the prescribing standard. A curriculum mapping exercise was undertaken to determine how well the PCF was addressed across the disciplines of paramedic science, pharmacy, podiatry, nurse practitioner and optometry. Identified gaps in teaching and/or assessment were noted.

RESULTS

Prescribing skills and knowledge are taught and assessed using a range of methods across disciplines. A multi-modal approach is employed by all disciplines. The Pharmacy discipline uses more tutorial sessions to teach prescribing principles and relies less on case studies and clinical appraisal to assess prescribing when compared to other disciplines. Within the pharmacy discipline approximately 90% of the PCF competencies are taught and assessed. This compares favourably with the other disciplines.

CONCLUSION

Further work is required to establish a practical, effective approach to the assessment of prescribing competence especially between the university and clinical settings. Effective and reliable assessment of prescribing undertaken by students in diverse settings remains challenging.

Teaching on smoking cessation to pharmacy students in Thailand

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INTRODUCTION

Pharmacists in Thailand play an important role in providing smoking cessation to patients. To link pharmacy education to practice on smoking cessation, this paper reports about teaching on pharmacists' roles in smoking cessation to 120 fourth year pharmacy students at the Faculty of Pharmacy, Chiang Mai University, Chiang Mai, Thailand

METHODS

A lesson plan of smoking cessation was created according to pharmacy curriculum, past experiences of teaching smoking cessation and students' opinions on how to learn to help smokers.

RESULTS

Students' opinions were that learning from real smokers in addition to a lecture was essential. Thus, a 6 – hour lesson of smoking cessation was divided into 2 parts; a 3 - hour lecture on dangers of smoking and roles of pharmacists in smoking cessation, and a 3 - hour practice. The practice was role playing of students to be pharmacists to provide counselling to smokers to quit smoking. Real smokers were also invited for students to provide counselling. Besides, some students will have more training on smoking cessation when they do their clinical clerkships in year 6 of pharmacy education.

DISCUSSION

After this class, the students reported that they had more understanding about smokers and felt more confident in helping smokers to quit smoking. Semi-structure interviews will be conducted with these students to provide feedback regarding impact of learning from the Faculty of Pharmacy on their experiences in providing smoking cessation in order to plan the lesson for the next year.

Attitudes of pharmacy students regarding pharmacotherapeutics of people with disabilities

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Barriers to optimal healthcare for people with disabilities include prejudices of health care professionals, and poor communication skills. This study investigated the effectiveness of an educational intervention for final year pharmacy students focusing on medication management of disabling conditions.

METHOD

An evidence – based questionnaire was administered before and after an intervention consisting of lectures and an interactive workshop. The workshop included exercises simulating vision and gross motor deficits and the opportunity for student reflection. The Wilcoxon Signed Rank Test was used to determine changes in attitudes.

RESULTS

At baseline, 60% of students agreed or strongly agreed that they could identify medication issues, 41% felt confident in communicating with people with physical or intellectual disabilities and 33% felt confident in managing medication use. Following the intervention a positive change in attitudes was observed. Students' perception of their ability to identify medication issues was significantly increased ($z = -6.3$ $p < 0.001$; median score increased from 18-20). Similarly students' confidence in communicating with patients with a disability was enhanced ($z = -5.2$ $p < 0.001$; median score increased from 6 to 7). Confidence in managing medications also improved ($z = -6.6$ $p < 0.001$; median score increased from 9 -10). Content analysis of students' reflections suggested that they had a more empathic understanding of pharmacotherapeutics in people with disabilities following the workshop.

DISCUSSION

To our knowledge this is the first Australian study to quantitatively explore pharmacy undergraduates' attitudes to medication use in people with disabilities. The results could inform future pharmacy undergraduate education in the area of disability.

Evidence based education for pharmacists to improve the management of paediatric asthma

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INTRODUCTION/AIM

Practitioner Asthma Communication and Education (PACE) Australia originally developed in the USA was modified for Australian general practitioners to improve clinician-patient communication and patient education.

The aim of this study was to adapt PACE Australia to the community pharmacy setting (PACE for Pharmacy), to test its feasibility and to gauge the potential impact of the program on pharmacists' practices.

METHOD

Recruited pharmacists were trained in the PACE for Pharmacy program, which was developed on the framework of PACE Australia. Pharmacist self-reported data relating to patient education and communication strategies was collected pre and 1 year post program completion. Shapiro Wilks test was used to determine the normal distribution of data. The mean pharmacist self-reported scores for each item was compared pre and post training using a Paired Samples T-Test (sig. 0.05, power 0.8). Pharmacist feedback surrounding program satisfaction/acceptability was also collected

RESULTS

All participants (n=44) completed the two 3 hr workshops of the PACE for Pharmacy program. There was full participation by the participants in all the activities, including writing asthma management plans. Pharmacists' self-reported data show a statistically significant increase in pharmacist confidence and frequency of use of communication strategies and improved education practices when counselling on new asthma medicines. The workshops were judged to be very valuable with majority of participants indicating that they 'gained a lot'.

DISCUSSION/CONCLUSION

This study provides preliminary evidence that PACE can be translated into community pharmacy and that it has potential to improve pharmacists' communication skills and patient education. The high response rate shows that pharmacists are eager to expand on their clinical role in primary healthcare.

Pharmacy students' attitudes to, and use of, traditional healthcare

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BACKGROUND

Healthcare practitioners are moving to more culturally-competent care, and this can include education on traditional healthcare practices common in ethnic minority communities. Pharmacy students themselves come from many different cultural backgrounds, and may use traditional healthcare, so educators cannot assume that all students have shared knowledge or attitudes towards traditional healthcare. The aim of this study was to explore New Zealand pharmacy students' knowledge and beliefs about traditional healthcare at the beginning of the pharmacy course, and to examine whether these changed during the course.

METHODS

University of Otago students were surveyed in their first and final year of Pharmacy studies to gauge students' use of and beliefs about traditional healthcare, ethnicity and acculturation.

RESULTS

Students were from a wide range of ethnic groups. Traditional healthcare use rose from 48% in their first year to 63% in their final year, but their attitudes did not change. A wide range of products were used, primarily herbal, mostly for minor illness or prevention. Students who were not of New Zealand European ethnicity were more likely to use traditional healthcare. Students primarily used traditional healthcare from their own culture. The main reported reasons for use were because they had experienced the effectiveness of traditional healthcare, family encouragement or because it was part of their culture.

DISCUSSION

Despite the focus on biomedical approaches to healthcare within the pharmacy course, students' attitudes to traditional healthcare did not change but their reported use increased.

Illuminating the profession's competency standards to bachelor of pharmacy students using individualised 'traffic light' reports

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METHODS

Drawing on Participatory Action and Educational Design Research principles, the project aimed to improve students' understanding of the Competency Standards (CS) and their relevance to the Bachelor of Pharmacy (BPharm) program. The report's development involved:

1. Mapping all assessment items to the CS and levels of Miller's Pyramid.
2. Student self-assessment of their progress against the CS.
3. Combination of mapping results with the students' performance to produce a traffic light report for each student (green – 'acceptable progress', amber – 'borderline', or red – 'improvement required'). Self-assessment results were included as a comparator.

A feedback survey evaluated students' understanding of the CS and their perceptions of the traffic light report.

RESULTS

Of 163 BPharm students (Semester 1, 2014), 103 consented to participate; 69 completed the self-assessment. Preliminary analysis from the survey (n=72) indicates understanding of the relevance of the CS has increased since a previous 2012 survey (83% vs. 67%, p=0.01). Forty-four percent of students believed that their self-assessment corresponded with their actual assessment. Qualitative responses suggested the report was seen as valuable in illuminating the CS within the program; 68% requested to receive it again in Semester 2.

DISCUSSION

Preliminary analysis indicates that the traffic light report was associated with an increase in student understanding of the relevance of CS to pharmacy undergraduates during their degree. Students may require additional support in self-assessment but they are positive about continuing to map their progress using this tool. Further data analysis, repeated data collection and validation is planned for Semester 2, 2014.

Perinatal depression screening: a systematic review of its acceptability in primary healthcare settings

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AIM

This systematic review explored the acceptability of perinatal depression (PND) screening and screening tools in primary healthcare (PHC) settings.

METHODS

A literature search was conducted by searching MEDLINE, PubMed, CINAHL, EMBASE, PsycInfo, Maternity and Infant Care and Joanna Briggs Institute from January 1994 to September 2014. Studies were included if they assessed the acceptability of PND screening within a PHC setting or a PND screening tool, from patient, provider or public perspectives. Studies were critically analysed based on the strength and quality of tools or procedures used to measure and assess acceptability, then classified as weak, intermediate or strong.

RESULTS

Twenty-five papers, investigating the acceptability of PND screening within a PHC setting or of a PND screening tool, were included. Twenty-four papers reported that the majority of participants found PND screening or a PND screening tool acceptable. A range of qualitative and quantitative measures, which varied greatly in their strength and quality, were used to assess acceptability.

DISCUSSION

PND screening, by means of a tool or clinical assessment, in a wide variety of PHC settings is generally acceptable to perinatal women, PHC providers and the public. The comprehensiveness of our methods allowed for inclusion of a wide array of studies; however, this required careful assessment due to the variability in methods used to evaluate acceptability. Given the prevalence of PND and the burden on mothers, children, partners and the family unit, PHC professionals, such as pharmacists, are in an ideal position to provide screening. Interestingly, no studies were identified whereby pharmacists were involved in PND screening; hence, future research in this area is warranted.

Does cigarette smoking influence the effectiveness of antidepressants in the management of depression? An exploratory study with consumers.

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Innovation and Evaluation, Aftercare, Rozelle, New South Wales

AIM

Recent studies have shown an association between depression and smoking yet smoking status is rarely taken into account in efficacy trials for antidepressants. Therefore, the aims of this study were to explore the impact of smoking on depression, and the potential interaction between smoking and the effectiveness of antidepressants from consumers' perspectives.

METHODS

Adults with a history of smoking and who were currently taking an antidepressant for the management of depressive symptoms were recruited through Aftercare, a non-government organisation. Semi-structured interviews (13 face-to-face and 3 telephone) were conducted on sixteen adults. The data were transcribed verbatim, managed using NVivo and thematically content analysed with the method of constant comparison.

RESULTS

Five major themes were identified from participants' self-reported experiences: relief of anxiety-related symptoms rather than affective symptoms; temporary perceived benefits on mood whilst smoking a cigarette; motivation to quit based on concerns for physical health and cost; unstable or worsening mental health as a barrier to quitting; unawareness of whether smoking influences the effectiveness of antidepressants.

DISCUSSION

Participants reported that cigarette smoking has variable effects on depressive symptoms, reflecting the inconsistent findings among the current literature. This is the first study to examine the potential impact of smoking on the effectiveness of antidepressants from consumers' perspectives. Although most participants had not considered such an interaction, a few stated that their response to the antidepressant medicine influenced their smoking habit in the short term. Due to lack of generalisability, further studies are required to elucidate the complex interplay between smoking, depression and antidepressant use.

Antidepressant and Anxiolytic Medication Use Pre and Post Cyclone Yasi In North Queensland

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Natural disasters elicit different responses, with the degree of exposure often influencing the presentation and severity of psychological events. Although the supply chain during natural disasters has been investigated, there has been little research into the effect on medication usage after natural disasters. The aim of this study was to determine whether there were significant changes in prescription rates of antidepressant and anxiolytic drugs following Cyclone Yasi and if this was affected by the extent of damage sustained by the area.

METHODS

A quantitative determination of new prescriptions of antidepressants and anxiolytics was conducted. Using data collected from regulatory authorities for the affected region, the total number of new prescriptions for these drugs was calculated for the period six months after the cyclone and compared with the same six month period in the preceding year. Two control drugs were also included to eliminate any changes in general rate of drug prescription in the affected communities.

RESULTS

Prescriptions of all antidepressant and anxiolytic drugs increased in the periods following Cyclone Yasi. There was a greater increase in prescription rates in the 14 to 54 and 55-95 year old categories in those areas that were directly hit by Cyclone Yasi (6.4%:5.2%) compared to those not directly hit areas (2.7%:3.3%).

DISCUSSION

Although the increase was less than expected, it was concluded that there is a direct correlation between the extent of exposure to the event and the degree of damage and increased rates of antidepressant and anxiolytic prescriptions.

The effect of knowledge and expectations on adherence to and persistence with antidepressants

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BACKGROUND

Adherence to and persistence with antidepressants are often suboptimal. However, little is known about how patient knowledge and outcome expectations may influence antidepressant adherence and persistence.

METHODS

Individuals who had been prescribed their first antidepressant to treat depression in the preceding six months were recruited to an online survey via Facebook. Knowledge, education received and initial outcome expectations were analysed for associations with persistence and adherence.

RESULTS

There were 220 surveys analysed. A total of 117 participants had taken their antidepressant for at least three months, while 25 had never started or stopped after less than three months without their doctor's involvement. Differences in expectations and various educational messages amongst persistent and non-persistent participants were identified. The instruction "don't stop it without checking with your doctor" was a significant independent predictor of persistence (OR = 5.9, 95% CI = 1.4-24.5).

At the time of the survey, 82.7% participants were taking an antidepressant and 77.9% were adherent. Significant independent predictors of adherence were a greater age (OR = 1.1, 95% CI = 1.0-1.2), knowledge (OR = 1.6, 95% CI = 1.1-2.3), being informed of common side effects (OR = 5.5, 95% CI = 1.1-29.0) and having discussed ways to solve problems (OR = 3.9, 95% CI = 1.1-14.5).

DISCUSSION

Improving outcome expectations and particular educational messages may increase adherence and persistence. Greater knowledge may help adherence. Further investigation is warranted to investigate whether a focus on these simple educational messages will improve outcomes in patients who commence an antidepressant.

An Audit of Psychotropic Medication Monitoring in Australian Aged Care Facilities

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BACKGROUND

The frequent long-term use of psychotropic medicines in aged care facilities (ACF) has been of world-wide concern for many decades. In Australia, 49% of residents regularly take psychotropic medicines. To date, there has been a lack of literature on the monitoring practices for psychotropic medicines in Australian aged care facilities.

OBJECTIVE

The primary objectives of this study were to determine the proportion of psychotropic medicines prescribed to ACF residents, which have been clinically reviewed within the preceding six months and to describe the nature of such reviews.

METHODS

A convenience sample of 17 aged care facilities in New South Wales was included. De-identified data containing: patient demographics, medication order, presence, date and type of review and reviewer, were provided by accredited pharmacists from Meditrax Pty Ltd, as part of the Psychotropic Medicine Audit process.

RESULTS

Of 1086 residents, 622 (57%) residents were on psychotropic medicines for six months or longer. Data was collected from 522 residents, prescribed 950 psychotropic medicines. Of these medicines, 53% (n=505) were clinically reviewed by a prescriber (92% GPs, n=494). In 17% (n=84) of reviews a change in therapy occurred, with more than half (52%) resulting in dosage escalation.

DISCUSSION

Half of all psychotropic medicines were not reviewed within the preceding six months. Few reviews resulted in a change in therapy, with the minority resulting in dosage reduction. Thus, current psychotropic monitoring practices are not effective in reducing the use of psychotropic medicines, nor compliant with current guidance.

The experiences of stigma and discrimination from community mental health clients in NSW: a cross sectional study

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OBJECTIVE

To describe the experiences of stigma and discrimination among people with schizophrenia in NSW.

METHODS

This cross-sectional study used the Discrimination and Stigma Scale (DISC) through structured face-to-face interviews with clients of the Assertive Outreach Team with schizophrenia. The DISC is a reliable and valid, quantitative and qualitative instrument used to explore and measure levels of negative, anticipated and positive discrimination. Relevant clinical history and socio-demographic information were also collected.

RESULTS

Fifty clients participated in the study, predominantly male, n=36 (72%), with a mean age of 49 years (SD=11.5). Forty participants (80%) experienced negative discrimination in at least one life area. Negative discrimination was most commonly experienced in being avoided or shunned (n=25, 50%), by neighbours (n=24, 48%) and family (n=23, 46%). Twenty-one participants (42%) reported experiencing discrimination from mental health staff compared to nine participants (18%) experiencing discrimination whilst getting help for physical health problems from pharmacists, doctors or dentists. Anticipated discrimination was common, with half of participants feeling the need to conceal their mental health diagnosis.

DISCUSSION

This study showed that discrimination is highly prevalent amongst people with schizophrenia in everyday aspects of life. Interestingly, participants often stopped themselves in activities due to anticipated discrimination even without previous experienced discrimination. Most unfair treatment by mental health staff can be attributed to involuntary treatment and lack of belief in medicines. Healthcare professionals, including pharmacists have a significant role in decreasing stigma. Hence more research is needed to improve attitudes and practices of health professionals in reducing stigma and discrimination in mental health.

The impact of reducing sedatives on residents: the rationale for translating sedative reduction into clinical outcomes

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BACKGROUND

Psycholeptic (predominantly antipsychotics and benzodiazepines) usage is high in many residential aged care facilities (RACFs). Antipsychotics are often employed to treat behavioural and psychological symptoms of dementia (BPSD) while benzodiazepines are frequently used to alleviate anxiety and sleep disturbances, despite the risk of severe adverse effects and limited efficacy. Antipsychotic reduction has not been shown to worsen or improve BPSD except in sub-groups of residents depending on baseline BPSD severity. Furthermore, research is conflicting as to whether or not psycholeptic reduction diminishes the rates of falls.

AIM

This research aims to observe the impact of psycholeptic reduction on resident clinical outcomes within a multi-strategic project.

METHODS

Currently, a multi-strategic intervention involving auditing, education and review, called the “Reducing the Use of Sedatives” (RedUSE) project, is being expanded nationally to promote appropriate use of psycholeptics in RACFs. While previous interventions have shown success in reducing psycholeptic use in RACFs, few have evaluated the impact on resident clinical outcomes. Changes in BPSD will be monitored through psychometric testing including the Neuropsychiatric Inventory-Nursing Home Version. Baseline measurements will be taken prior to the start of the RedUSE project and repeated after four months. Behaviour and falls rates will be monitored monthly from baseline by a champion nurse at each RACF.

RESULTS/DISCUSSION

Data collection will take place between November 2014 and January 2016. Translating the impact psycholeptic reduction has on resident clinical outcomes within a multi-strategic project is predicted to be of high importance to both the government and research community at large.

Preliminary findings of the stability of Thyroxine tablets stored at room temperature

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OBJECTIVE

Storage advice for levothyroxine sodium tablets has changed twice in the twenty-first century. The first change recommended refrigeration, with tablets being considered stable for up to forty days at room temperature. More recently, room temperature storage has been limited to no more than fourteen days. This greatly reduces the feasibility of repackaging thyroxine tablets for supply in dose administration aids (DAAs).

METHODS

Oroxine 50mcg tablets which had been stored at room temperature (around 22°C) for over 28 days were compared to refrigerated tablets of the same batch and expiry date, for content via high performance liquid chromatography (HPLC). A Waters 600E Multisolvant Delivery System, with a 2996 photodiode Array detector, an automatic injector and an Atlantis Column (C18, 3.9mmx150mm, 5µm) constituted the HPLC apparatus. The mobile phase consisted of 40% HPLC grade Acetonitrile, with 1% Acetic Acid and MilliQ water, and the samples were eluted for 20 minutes.

RESULTS

A reduction ranging between 3% and 20% was found between tablets stored under refrigeration and tablets stored at room temperature.

CONCLUSIONS

Narrow therapeutic window medicines require a reduction in content of no less than 5% until expiry. As hypothyroidism is a closely monitored, dose sensitive condition, these preliminary findings support the fourteen day room temperature expiry. However, for consumers living remotely, or with reduced cognition, the improved compliance resulting from utilising DAAs may average out to an improved clinical outcome, for these individuals. Further clinical research is necessary to inform this debate.

Medication Management Plans as medicine reconciliation tools: can you spot the discrepancy?

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METHODS

Adult patients admitted to the Emergency, Medical Assessment Unit, Acute Aged Care and Stroke wards fitting the eligibility criteria for a Medication Management Plan (MMP) were included. A Best Possible Medication History (BPMH), using at least two sources, was obtained by the study pharmacists and recorded on the MMP. Unjustified differences between medications from the BPMH and the medication chart were classified as unintentional discrepancies and recorded on the issues page of the MMP. Unintentional discrepancies, both resolved and unresolved, at 24 and 48 hours after identification were measured. A validated tool used by a consultant, registrar and two pharmacists was applied to assess clinical significance of discrepancies.

RESULTS

In total, 152 patients, involving 1339 medications were included in the study. Results showed that almost 70% of patients experienced at least one unintentional change to their medications on admission. Over 83% of medications classified as high risk were successfully reconciled on admission. Of the 271 discrepancies recorded, the majority were classified as medication omissions (64%). The majority of discrepancies (74%) had the potential to cause moderate harm and almost 7% had potential to result in severe harm. It was found that 52% of unintentional discrepancies which were followed up were resolved within 24 hours and an additional 5% were rectified by 48 hours.

DISCUSSION

Pharmacist initiated MMPs have proven to contribute positively to medication reconciliation on admission. Wider use of MMPs in the future and subsequent studies are required to measure the contribution of MMPs towards the discharge process.

Combination analgesics containing codeine - what can pharmacists do? A Delphi study

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Misuse/dependence on non-prescription compound analgesics containing codeine (OTC CACC) can result in serious physiological and psychological harms. This study sought to explore pharmacists and other key professionals ideas and views on possible strategies for managing OTC CACC misuse/dependence in community pharmacies.

METHODS

A three iteration Delphi study was conducted to gain participants consensus view. The first round questionnaire was qualitative in nature and sought to explore opinions on issues and possible strategies that could be used to manage OTC CACC misuse/dependence. Responses from the first questionnaire were compiled and fed back to participants to enable reflection and further evaluation by the expert panel. Following analysis of the second-round questionnaire strategies with high agreement and consensus were included in the third round questionnaire for further evaluation.

RESULTS

Forty (77%) of the 52 experts within the fields of pharmacy, and drug addiction/abuse contacted about the study agreed to participate. Response rates were 65%, 67.5% and 50% for the first, second and third rounds respectively.

Participants reached a consensus on strategies that would be most effective, and have the highest impact on OTC CACC misuse/dependence, once implemented into clinical practice. The highest ranked strategies included utilisation of a National real-time database, to monitor product sales; training to improve pharmacist communication with patients; and development of a well-defined referral pathway, to be used by pharmacists for identified at-risk patients.

DISCUSSION

Due to the high-level of consensus achieved, strategies generated represent useful approaches for pharmacy practice that could be utilized to effectively manage OTC CACC misuse/dependence.

Standardisation of over-the-counter labels using the 'medicine information box' format: consumer perspectives

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INTRODUCTION

Over-the-counter (OTC) product labels are accessible information sources for consumers to support safe medication use. In 2012, the Therapeutic Goods Administration released a consultation paper proposing OTC labelling standardisation to improve label quality, via implementation of the Medicine Information Box (MIB) format¹. However, consumer opinions of the MIB remain relatively unexplored. Therefore, this study aimed to explore consumer perspectives of the MIB format proposed for OTC label standardisation in Australia.

METHODS

Semi-structured interviews were conducted with 40 consumers. Consumers were provided with a mock MIB (developed by the research team, guided by the consultation paper¹) as stimulus material during the interviews. Consumer perspectives on OTC label standardisation, opinions on the MIB format and perceived improvements were explored. All interviews were audio-recorded with permission, transcribed verbatim and thematically content analysed.

RESULTS

Consumers expressed a range of opinions towards OTC label standardisation, from welcoming standardisation to concern that important details may be overlooked. The MIB was positively received due to its perceived good information design and ease of navigation. However, some felt the MIB invoked fear about the medicine. Consumers requested re-ordering of information; specifically, for the active ingredient to be moved to a less prominent position. Suggested improvements centred on content and design changes e.g. colour, pictographs, bolding.

CONCLUSION

Consumers saw the MIB as a feasible standardised format to implement for OTC labels and positively viewed its good information design. However, consumers felt that improvements to content and design are required prior to implementation to enhance its quality and usability.

1. Australian Government Department of Health and Ageing Therapeutic Goods Administration. TGA Medicine Labelling and Packaging Review: Consultation Paper Version 1.0 May 2012. Australian Capital Territory: Commonwealth of Australia, 2012. Report Number.:R12/759506.

Pharmacists translating evidence into practice: Expansion of the Reducing Use of Sedatives (RedUSE) project to Australian Aged Care homes

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BACKGROUND

For over 20 years, concern has been raised over the overuse of antipsychotics and benzodiazepines ('sedatives') in aged care. The Reducing Use of Sedatives (RedUSE) project was developed as a multi-strategic and interdisciplinary initiative. Its key strategies, namely audit & feedback, education and sedative review, were tested in a controlled 6-month trial of 25 homes in 2009. In 2013, the Australian Government awarded substantial funding to deliver RedUSE to 150 homes nationally. This abstract describes how the RedUse project was evaluated and enhanced during expansion.

METHODS

A thorough assessment of the barriers and enablers associated with the RedUSE trial was performed in line with the Theoretical Domains Framework (TDF)¹. Qualitative methodology comprising of two focus groups with nurses and pharmacists was selected to ascertain key barriers and enablers. Behavioural change techniques were subsequently identified and tested in a pilot phase comprising of 27 homes across three states.

RESULTS

The main barriers to RedUSE were the belief that sedative medications improved resident quality of life, poor GP engagement and perceived roles of health practitioners in reviewing sedatives. The RedUSE project was enhanced by the development of a customised training program which challenged beliefs, and also clearly defined health practitioner roles when reviewing sedatives. The training was delivered via two small group workshops. Academic detailing was delivered by professional detailers to inform and engage GPs.

DISCUSSION

The TDF proved an effective tool to identify the key barriers and enablers to the RedUSE project, facilitating the incorporation of several novel behavioural change techniques.

REFERENCE:

1. French S, Green S, O'Connor D et al. Developing theory-informed behaviour change interventions to implement evidence into practice: a systematic approach using the Theoretical Domains Framework. *Implement Sci* 2012, 7:38: <http://www.implementationscience.com/content/7/1/38>

Development of a benchmarking tool for pharmacy students using threshold learning outcomes.

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METHODS

Benchmarking is crucial for ensuring the quality of the learning experience offered by a curriculum. This project aimed to develop, refine and validate a tool based on the pharmacy threshold learning outcomes (TLOs) to facilitate benchmarking of students' performances in verbal 'capstone' assessments in Australian pharmacy programs.

A pilot tool was developed and trialled by local and external examiners during the University of Tasmania (UTAS) 2013 Bachelor of Pharmacy Fourth Year verbal examinations. Usability and acceptability were assessed using a survey and the tool was evaluated for validity and inter- and intra-rater reliability using Pearson correlation coefficients (R). The tool was refined using these results, and a validation exercise is planned for late 2014.

RESULTS

In the initial evaluation, agreement on TLO scoring was excellent between UTAS examiners (R values 0.73-0.88; n=29 comparisons); and very good between the Tasmanian and external examiners for most TLOs (R=0.59-0.68; n=12). Agreement between allocated marks and TLO scores were also very good (R=0.62-0.85; n=29). Survey results recommended improving alignment of the TLOs with the assessment activity, simplifying the rating scales and providing training regarding the tool.

DISCUSSION

Progress is underway towards the development of a relatively simple, flexible and validated benchmarking tool to facilitate high quality student outcomes across Australian pharmacy programs. Training in the use of the tool has been identified as a major enabler of its successful and consistent application, and a scenario-based training video is currently being produced. The tool and training video will be showcased in this presentation.

Pharmacist Orientation to Rural and Remote Practice: How are we doing?

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BACKGROUND

Introducing pharmacy students to rural and remote practice is one of the strategies developed by universities to address the deficit of rural practitioners. A rural and remote elective is offered to JCU pharmacy students in Mount Isa and Katherine. Part of this program required students to utilise this experience to present how they as pharmacists would prefer to be oriented to rural and remote practice

METHODS

Information was gathered from the four students using narrative techniques, with their journals describing both personal and professional experiences. Content Analysis was then applied to the data, using the Social Representation Theory. Students were also required to generate an orientation brochure, appropriate for a pharmacist commencing employment in a rural and remote location.

RESULTS

Data collected provided consistent information, with major themes around cultural diversity and awareness, including Indigenous healthcare, opportunities, multidisciplinary involvement and surrounding areas, all being seen as key to the successful orientation of a pharmacist for rural and remote practice. Orientation brochures designed, will be presented.

DISCUSSION

The rural elective program encouraged the pharmacy students to engage in community activities and as such, this model strengthens the relationships for collaboration in the community, which fosters potential for multidisciplinary healthcare. In addition they were supported in stepping out of the traditional practice, which informed their presentation of what would constitute an effective orientation for a rural pharmacist. This exercise, clearly indicating that we are not doing well, highlights the need for more effective orientation for pharmacists in rural and remote practice.

Interdisciplinary learning and teaching at the Remote Health Experience: where are we at in 2014, four years later?

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BACKGROUND

Achieving meaningful interprofessional learning is a challenging goal. The Remote Health Experience is part of the year one Medical course; a team of interdisciplinary academics designed and implemented an interdisciplinary program where students from medicine, pharmacy, aboriginal health worker courses and nursing degree, would be combined and would practice skill stations as multidisciplinary groups. In 2011 the first Flinders NT program was launched and interdisciplinary teams of participants (teachers and learners) engaged in the activity. Four years later we want to evaluate where has the program headed incorporating the feedback collected from the 2011-2-3-4 evaluations completing the loop for responsive quality improvement.

METHODS

This presentation will describe the key aspects of the four-year interdisciplinary educational program evaluation and demonstrate the relevance and importance of program evaluation including specifics around Indigenous participation and contribution.

The evaluation integrates process evaluation into a continuous, and thus responsive, quality assurance model using anonymous and voluntary surveys given to all participants after each station and at the end of the program.

RESULTS

From 2011 to 2014 there has been an important change in the satisfaction level of students and facilitators as the years progressed on. In the student cohort the level of satisfaction raised from 65% on 2011 to 95% on 2014. The rating of the learning objectives completion increased by 40% in 2014 in comparison with 2013 rating level.

DISCUSSION

The four year evaluation reported that all participant students stated the benefits from the interdisciplinary learning program and the teachers reported an enhancement of their teaching skills by practising in an interdisciplinary team and enjoyed the event. The program in its structure and delivery is unique and innovative with a real interprofessional design. Future evaluation will look into the alignment of learning objectives across the four disciplines for the sustainability of the initiative.

Simulated learning from the classroom to pharmacy placements

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INTRODUCTION

Simulated learning is used to enhance skill development and expose students to clinical situations they may not otherwise encounter. This research aimed to promote development and application of enhanced communication skills (motivational interviewing) through integration of simulated learning activities into the master of pharmacy fourth year course.

METHODS

Simulated patients were incorporated into sequential fourth year experiential pharmacy practice courses as part of the multidisciplinary *Simulated Telemedicine Environment Project for Students (STEPS)* exploring simulated learning through innovative technology in health discipline education. Simulated learning was then piloted in hospital placements and in an inter-professional activity with exercise physiology students. Scenarios reflected common practice issues (i.e. adherence) and issues less frequently encountered by urban students (i.e. rural scenario and telemedicine). Student motivation and confidence were measured pre and post activity on five and seven point scales for validated items and pharmacy specific skills.

RESULTS

Sixty-eight students are enrolled in the fourth year and student surveys were completed for two in-course activities (n=34, n=49), hospital placements (n=16) and inter-professional education (n=14). Student confidence in conducting patient assessment initially increased (3.60 to 3.95) and the majority agreed that simulated learning better prepared them for OSCE assessment. All fourteen students agreed or strongly agreed that inter-professional education better prepared them for collaborative management of cardiovascular disease.

DISCUSSION

Structured simulated learning activities improved student confidence and motivation and promoted development of enhanced communication skills relevant to pharmacy practice. Opportunities to contextualise skills during placement and inter-professional education revealed benefits which have implications for curriculum development.

Pharmacists' professional use of social media

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Social media (SM) is frequently used by consumers and healthcare professionals. However, it is not clear how pharmacists are using SM as part of their daily professional practice. This study investigated the professional use of SM by pharmacists.

METHODS

In-depth semi-structured interviews were conducted with practicing pharmacists (n=24) from 6 different countries. Interviews were recorded, transcribed verbatim and thematically content analysed.

RESULTS

Wikipedia, YouTube and Facebook were the main SM platforms used, though primarily for personal reasons. Professional use of SM was limited to continuing education, support for consumer advice giving, networking, self-promotion and business support. Wikipedia was a learning tool used as a first option for general overviews of unknown topics or as a last resort for difficult-to-find information. No pharmacy-related contribution to Wikipedia was reported. YouTube was used both for self-education and supporting counselling. University lectures or professionally made videos were widely watched. Short videos were sometimes used to supplement oral and written information provided to consumers in the pharmacy. Facebook was used for professional networking, promotion of achievements, and advertisement of job opportunities. It also afforded engagement in discussions and information sharing among peers. Most pharmacists had a blurred professional and personal presence on SM. However no pharmacist-patient interaction on Facebook took place. Participants believed that interactions with consumers should take place via a dedicated pharmacy Facebook page.

CONCLUSIONS

Participants used SM for professional reasons, primarily for continuing education and support for consumer education. They were reluctant to use SM as a medium for interacting with consumers.

Patient preferences for pharmacist attire: Can pharmacists dispense with the white coat?

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BACKGROUND

Clothing can be a form of non-verbal communication and a key element when forming initial impressions. A healthcare professional's appearance may influence their relationship with patients, which in turn may affect treatment outcomes. Therefore, understanding patient perceptions regarding a pharmacist's attire and its influence on perceived professionalism and friendliness is important.

METHODS

5 photographs in varying degrees of dress formality (casual to formal, including white dispensing jacket) were taken of 12 models, including a mix of males and females, and a range of ages (student and experienced pharmacists) and ethnicities. Patients were approached in community pharmacies around New Zealand, with each being shown photographs of one male and one female model, rating each in terms of perceived professionalism and friendliness.

RESULTS

269 patients were surveyed. Most levels of formality were rated similarly, except for the most casual, which was not rated highly for either professionalism or friendliness. Adding a white dispensing jacket to casual attire lifted ratings back in preferred levels. Substantial variation was explained by including the town/city of data collection as a predictor. Patients were more tolerant of casual dress in experienced pharmacists relative to student pharmacists. Quality of treatment and location were rated as more important factors than attire in choice of pharmacy.

DISCUSSION

Considering the location of practice is an important factor to consider in choosing how to dress. In particular, younger pharmacists and students should take additional care not to appear too casually dressed.

Australian community pharmacists' knowledge and practice in supporting the management of cardiovascular disease

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OBJECTIVES

To investigate Australian community pharmacists' knowledge about cardiovascular disease (CVD) medication therapy and activities in supporting clients with established CVD.

METHODS

A self-administered questionnaire was posted to a random sample of 1350 community pharmacies stratified by state/territory in Australia. The pharmacist-on-duty was asked to indicate: 1) classes of secondary prevention medicines recommended by National Heart Foundation and National Stroke Foundation guidelines for CVD i.e. angina, acute coronary syndrome (ACS) and stroke; 2) professional activities provided to support clients with CVD; and 3) the number of interactions related to CVD with other healthcare professionals in the last two weeks.

RESULTS

Following three waves of the survey, a response rate of 16% (209/1320) was obtained. The proportion of respondents with correct answers for secondary prevention therapy of angina, ACS and stroke were 19%, 14% and 49%, respectively. The majority of respondents reported counselling on all aspects of CVD management and monitoring medicine-related problems. However, monitoring changes in lifestyle, clinical parameters, and therapeutic recommendations were infrequently provided. The majority reported at least one contact with a general practitioner in the past two weeks.

DISCUSSION

The findings of this study suggest that Australian community pharmacists have limited knowledge about secondary prevention of CVD and focus mainly on medication counselling, with limited involvement in ongoing monitoring. This suggests that their practice in supporting patients with CVD is underdeveloped. As they play an important role in addressing medicine-related problems and making therapeutic recommendations, there is a need to improve their knowledge of secondary prevention guidelines.

Comparing perceptions and work values of early career metropolitan and rural pharmacists in Victoria

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In Australia, there are too many pharmacists seeking employment in metropolitan areas and an ongoing shortage in rural areas. An understanding of pharmacists' reasons for practice location decisions may provide insight into how to correct this maldistribution. This study compared early career Victorian metropolitan and rural pharmacists' work values and perceptions of rural pharmacy practice.

METHODS

A secondary database containing responses to a postal questionnaire about work values and perceptions of rural practice was used. There were 258 responses [metropolitan pharmacists =155, rural pharmacists= 104]. The work values and perceptions data were fitted to the Rasch model. Logistic regression was performed to evaluate whether the scales significantly contributed to practice location.

RESULTS

Three subsets of the questionnaire conformed to the Rasch unidimensional parameters; career, lifestyle and intrinsic values. Early career pharmacists who worked in rural areas were 5.5 times more likely to have a rural background compared to metropolitan pharmacists and were 1.6 times more likely to perceive rural practice as satisfying their intrinsic values compared to metropolitan practice. Pharmacists employed in a metropolitan area were 1.4 times more likely to place importance on career orientated values than rural pharmacists. There was no difference between metropolitan and rural pharmacists and their importance of lifestyle values.

DISCUSSION

Selection of pharmacy students from rural backgrounds, finding ways to improve career opportunities for rural pharmacists and promoting rural practice to pharmacists who place high importance on intrinsic values could assist recruitment of pharmacists to rural areas.

Primary care pharmacists and paediatric asthma management: A parent/carer's perspective

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INTRODUCTION

Current evidence suggests that primary care professionals are not providing parents/carers with the much needed support to manage their child's asthma. This study aimed to report on parents'/carers' experiences with community pharmacists in the management of paediatric asthma, the current level of parental asthma knowledge and asthma-related outcomes of the child being managed.

METHOD

A descriptive and cross-sectional study was implemented. Community pharmacists were asked to administer self-reported questionnaires to parents/carers of children with asthma. The questionnaire elucidated information on satisfaction with pharmacists' care, pharmacists' practices (inhaler device demonstration/review and referral for a written asthma action plan (WAAP)), asthma knowledge and asthma-related outcomes of the child being managed (asthma control, emergency service utilization, WAAP possession and days missed from childcare/school or work). All data collected were analysed descriptively.

RESULTS

Seventy-four parents from 27 pharmacies located in the Sydney metropolitan region completed the questionnaire. Overall, parents/carers were satisfied with their pharmacists care, however 33% of parents reported being referred to a doctor for a WAAP, 47% reported that their pharmacist provided an inhaler device demonstration and 32% of parents' children had their inhaler device technique checked by their pharmacist. Parents/carers scored 21.3 (range 13-28) overall out of a possible score of 31, on the asthma knowledge questionnaire. The mean paediatric asthma control reported was 18.6 (≤ 19 =poor asthma control). Only 42% of parents reported having a written asthma action plan.

DISCUSSION/CONCLUSION

Despite their satisfaction with pharmacy services, the asthma knowledge of parents/carers is low and key pharmacy practices are not being implemented. By training pharmacists in paediatric asthma management and up-skilling them in appropriate communication strategies, the unmet needs of parents/carers of children with asthma may better be addressed by primary care pharmacists.

Quality use of respiratory medications in people with cognitive impairment

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INTRODUCTION

Up to 90% of inhaler users do not use them well enough to benefit from the prescribed therapy, as they are complex, non-intuitive devices. People with cognitive impairment can be prescribed inhalers especially if the impairment is not readily apparent. Whilst the impact of cognitive impairment on inhaler use has been examined in the elderly, no research exists for people with intellectual disability (ID), who are recognized to have poor respiratory health.

AIM

To explore issues around inhaler use in people with ID

METHODS

Mixed methods incorporating quantitative and qualitative techniques were used to characterise respiratory medication management in people with ID, understand their knowledge of asthma medication use, and examine the role of caregivers in asthma medication management.

RESULTS

People with ID were prescribed inhalers- often more than one device type. They may be self-managing, or assisted by caregivers. Our research showed that people with ID have a good understanding of the rationale for inhalers but poor knowledge of side effects and dosage. Caregivers perceived that they themselves need more suitable decision support tools.

DISCUSSION

ID and respiratory medication use is an under-researched area. Potential areas for improvement include prescribing of the fewest number of device types, individualized tailored education, and support for caregivers by means of training in inhaler use and asthma attack decision support. Further, to enable quality use of respiratory medications in people with ID, health professionals including pharmacists need to be proficient in communicating with people with ID.

Medication use in children: what do consumers really want to know?

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Despite widespread use, there is limited evidence of medication safety and efficacy for the 23% of Australians under 18. This study explored consumer knowledge gaps and concerns about medication use in children.

METHODS

We analysed calls from people under 18 or concerning this cohort, to a pharmacist-operated national consumer medicines call centre, NPS Medicines Line, 2002-June 2010. Calls were classified and narrative explored by age group: <1; 1-4; 5-14 and 15-17 years.

RESULTS

There were 14,753 paediatric related calls (mean age 4.1 years). Callers were predominantly female (91.5%), mean age 35.8 years. Most (89.4%) phoned for a child and 2.2% adolescents for themselves. Main enquiry types were: lactation (22.1%), dose (10.2%), adverse reaction (10.0%), interaction (8.4%) and vaccination (8.4%). However, the primary enquiry differed by age group: lactation (<1); dosing (1-4, 5-14) and interactions (15-17 years). Primary issues of concern were safety of a specific medication while breastfeeding (infants < 1 year) and age/weight/indication clarification for children 1-4 and 5-14 years. In contrast, interaction questions from adolescents focused on analgesics and other CNS drugs, cold and flu; contraceptives and recreational drugs. While paracetamol was top drug of interest across age groups, the remaining top 2 differed significantly: ibuprofen, amoxicillin (<1 and 1-4); methylphenidate, ibuprofen (5-14) and ethinylestradiol, levonorgestrel (15-17 years). Motivations to help seek were consistent across age groups - inadequate information, second opinion, worrying symptom and conflicting information.

DISCUSSION

Medication poses concerns for children and caregivers. By identifying and addressing these issues, we can improve quality use of medicines.

Pharmacist attitudes and behaviours surrounding the management of paediatric asthma

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INTRODUCTION/AIM

Current literature suggests asthma care in children, particularly in primary care, is not in line with guidelines. Studies exploring the role of Australian pharmacists in the management of paediatric asthma are scarce. The aim of this study was to explore the attitudes, confidence and self-reported practices of pharmacists with regards to paediatric asthma.

METHOD

Pharmacists (n= 77) were recruited from the Sydney metropolitan region and asked to complete a self-reported questionnaire that elucidated information on 4 general domains relating to pharmacists' paediatric asthma management within community pharmacy: 1) Guidelines and Continuing Professional Development (CPD); 2) Counselling and Medicines; 3) Communication and Self-management Practices; 4) Attitudes and Barriers to Practice. All data collected were analysed descriptively.

RESULTS

All 77 pharmacists completed the questionnaire. Only 25% of pharmacists reported using the national asthma guidelines and 32% had not completed any asthma related CPD in the past year. Just over half of the pharmacists (54%) reported providing device technique demonstrations for new inhaled medicines, and 35% reported checking if patients had a written asthma self-management plan. Although 65% of pharmacists reported confidence in communication skills, most pharmacists were not confident in setting short/long-term goals with the patient and carer for managing asthma at home. Pharmacists felt they are just as effective as doctors in providing asthma counselling and education. Lack of time was identified as a significant barrier.

DISCUSSION/CONCLUSION

We have identified gaps between community pharmacists' attitudes and behaviours. Pharmacists need more appropriate continuing education programs, which can translate into improved pharmacist paediatric asthma self-management practices and thus better health outcomes of children with asthma. This may require an alternative approach.

Measuring Patients' Subjective Experiences Of Living With Medicines

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Patient reported outcome measures (PROMs) are becoming an important component of healthcare evaluation. For patients who use multiple medications, maintaining a complex regimen potentially poses a significant impact on quality of life. As yet, there is no validated questionnaire designed to comprehensively assess patients' subjective experiences of living with polypharmacy. The aim of this study was to validate a recently proposed "Living with Medicines Questionnaire" (LMQ).¹

METHODS

A cross-sectional study was conducted using paper-based and online surveys. The 60-item LMQ surveys were completed by a convenience sample of UK respondents, which included community pharmacy patients and consumers approached on streets. Inclusion criteria were adults taking at least four medicines daily. Exploratory factor analysis (EFA) was used to elucidate the underlying factor structure. Internal consistency of the resulting domains was estimated using Cronbach's alpha.

RESULTS

Surveys were received from 267 respondents. Items with poor loadings or high cross loadings were removed leaving 48 items in the final EFA solution, which explained 56% of the variation. Ten domains were generated: Communication with doctor; Overcoming the interference to life caused by medicines; Satisfaction with medicines; Communication with pharmacist; Overcoming practical difficulties; Overcoming medicine concerns; Autonomy to vary regimen; Accepting medicine-taking; Continuity of treatment; Overcoming access difficulties. Cronbach's alpha ranged from 0.62 – 0.89.

DISCUSSION

The LMQ shows promise as a comprehensive measure of the impact of living with polypharmacy. It could become a foundation for evidence-based, patient-centred practice. Future research is planned to perform a confirmatory factor analysis using data from an Australian sample.

1. Kraska J, Morecroft CW, Poole H, Rowe PH. A novel instrument to measure medicines-related quality of life. Presented at 8th working conference of PCNE. *IJCP*.2013;35:488.

Pharmacy, professional responsibility and complementary medicines

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What are the responsibilities of pharmacists when selling complementary medicines? This paper focusses on the views of pharmacy support staff and consumers.

METHODS

One-on-one semi-structured interviews were conducted with pharmacy support staff and consumers in pharmacies in Greater Brisbane. Pharmacy support staff were asked to describe their responsibilities when selling complementary medicines; consumers were asked to describe their expectations when purchasing complementary medicines in a pharmacy. Interviews were transcribed and analysed separately by two members of the research team. Consensus was reached through discussion.

RESULTS

20 pharmacy support staff were recruited from four pharmacies. Pharmacy support staff identified their key responsibilities as: ensuring safety, selecting the right product for the right consumer and helping the consumer by making the sale. Pharmacy support staff varied in their approach to complementary medicines: some took on individual responsibility for their knowledge about complementary medicines and assessing consumer response. Other staff relied on the policies and training provided by the pharmacy.

33 consumers were recruited from 3 pharmacies. Consumer attitudes towards complementary medicines ranged from scepticism to preferred treatment. Most consumers discussed complementary medicine use in terms of maintaining good health. Consumers saw pharmacists as a resource, often after considerable independent research. Consumer expectations on the pharmacist include selecting the right product for the right person, expert product knowledge, and maintaining a wide range of good quality stock.

DISCUSSION

This study provides insight into the sale of complementary medicines in pharmacy. These insights help to inform the responsibilities of pharmacists when selling complementary medicines.

Turning the Heat up on Admissions: A Study of the Impacts of Extreme Heat Events on Tasmanian Hospital Admissions 2003-2010

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INTRODUCTION

Extreme heat events (both heat waves and extremely hot days) are increasing in frequency and duration globally and cause more deaths in Australia than any other extreme weather event. Numerous studies have demonstrated a link between extreme heat events and an increased risk of morbidity and death. In this study, the researchers sought to identify if extreme heat events in the Tasmanian population were associated with any changes in emergency department admissions to the Royal Hobart Hospital (RHH) for the period 2003-2010.

METHODS

Non-identifiable RHH emergency department data and climate data from the Australian Bureau of Meteorology were obtained for the period 2003-2010. Statistical analyses were conducted using the computer statistical computer software 'R' with a distributed lag non-linear model (DLNM) package used to fit a quasi-Poisson generalised linear regression model.

RESULTS

This study showed that RR of admission to RHH during 2003-2010 was significant over temperatures of 24°C with a lag effect lasting 12 days and main effect noted one day after the extreme heat event.

DISCUSSION

This study demonstrated that extreme heat events have a significant impact on public hospital admissions. Two limitations were identified: admissions data rather than presentations data were used and further analysis could be done to compare types of admissions and presentations between heat and non-heat events.

CONCLUSION

With the impacts of climate change already being felt in Australia, public health organisations in Tasmania and the rest of Australia need to implement adaptation strategies to enhance resilience to protect the public from the adverse health effects of heat events and climate change.

Complementary And Alternative Medicine Use By Patients Receiving Chemotherapy

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INTRODUCTION

Complementary and alternative medicine (CAM) that is biologically active has the potential to interact with conventional medicines, including anti-neoplastic treatments. Patients undergoing adjuvant treatment with curative intent chemotherapy need correct dose intensity to achieve best outcomes and negative interactions from CAM use could compromise chemotherapy effectiveness.

METHODS

75 solid tumour malignancy patients receiving curative intent chemotherapy attending a cancer care day unit were interviewed on CAM use on the day of receiving their first dose of chemotherapy.

RESULTS

60% (45/75) of study participants engaged in CAM use, of which 91% (41/45) orally ingested CAM. Biologically active CAM assessed as having potential to interact with prescribed chemotherapy was ingested by 27% (20/75) of patients. CAM was used by 51% (38/75) of patients during chemotherapy treatment for supportive care reasons and by 28% of patients (21/75) with the intention of treating their cancer. Patients' CAM decision-making was influenced by advice from family and friends, practitioners and from casual acquaintances met in person or on the Internet. Worryingly, 13% (10/75) of patients were told by a CAM adviser not to have chemotherapy treatment. The majority of patients (84%, 63/75) would have liked to receive information on which CAM is safe to use with chemotherapy before treatment commencement.

DISCUSSION

Patients being treated with chemotherapy with curative intent are unlikely to know the risks if they take biologically active CAM at the same time. Health professionals working in cancer care need to provide patients with evidence-based information on CAM use with chemotherapy.

Onychomycosis in the Northern Territory an omnibus survey

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Onychomycosis has been referred to as the most prevalent among nail disorders and accounts for about $\geq 50\%$ of all nail diseases and about 30% of all cutaneous fungal infections. In developed countries more than 10% of the general population is found to have onychomycosis. Onychomycosis is found to have a significant impact on patient's quality of life compared to many other dermatological disorders. Approximately half of all patients with onychomycosis experience pain or other types of discomfort. Our study examined patients' perception of onychomycosis on the quality of life.

METHODS

A total of 70 patients with clinically diagnosed onychomycosis were surveyed using an online survey tool in the Northern Territory (NT). Responses to a standardized quality-of-life questionnaire were analyzed for patient demographics, physical and functional impact, psychosocial impact, and economic impact.

RESULTS

Most of the participants were urban inhabitants (male (82.9%)), and about 64% of the studied population had onychomycosis for more than 2 years. Highest positive responses were nail-trimming problems (76%), embarrassment (74%), and pain (48%). Overall ~ 61% of the studied population reported that onychomycosis negatively affected the emotional aspects of their quality of lives (QoL), whereas in 55% of the participants QoL was negatively affected due to the disease symptoms, 32% of the studied subjects complained that their QoL was affected due to the impact onychomycosis on the functional aspects of their day-to-day lives.

DISCUSSION

Onychomycosis has significant social, psychologic, health, and occupational effects. Patients who experience more physical and emotional discomfort should get psychosocial interventions.

What drives prescription medicine sharing among patients? A qualitative study of healthcare professionals' perspectives using COM-B analysis framework

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METHODS

Medication sharing behaviours, the lending or borrowing of prescription medicines, can have many health outcomes - both positive and negative. However, much of the evidence has been from small cross sectional surveys, and this limits in-depth understanding of drivers of sharing behaviours. To address the gap, this study used the COM-B model to identify factors that influence patients' medicine sharing practices. COM-B hypothesises that human behaviour is the interaction between "Capability" (skill or knowledge to engage in the behaviour), "Opportunity" (environmental factors), and "Motivation" (the person's attitudes and beliefs). Eighteen face-to-face, semi-structured interviews were conducted with pharmacists, doctors, and nurses practicing in Auckland. The findings were interpreted using the COM-B framework.

RESULTS

Although some factors could be considered in more than one category, participants reported that patients' drivers for sharing behaviours include "capability" - related factors such as forgetting to carry own medication and lack of knowledge or misconceptions about the safe use of prescribed medicines. Being on the same medication, being busy, travelling, lack of access to health services, long waiting times at health facilities and having unused medicines, were some of the "opportunity" factor for sharing. Factors that enabled "motivation" to share included altruism, running out of previously prescribed medications, emergency situations, and fear of the consequences of stopping medicines and waiting for refill.

DISCUSSION

The findings suggest that medicine sharing is complex health behaviour. Therefore, any interventions to minimise the potential risks/harms of sharing should consider both internal (motivation and capability) and external factors (opportunity) influences.

Prescribing patterns of novel oral anticoagulants at a referral hospital

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METHODS

A prospective audit was undertaken during April – August 2014 in the cardiology wards at a tertiary hospital for patients who were prescribed Novel Oral Anticoagulants (NOACs). Baseline characteristics and biochemical parameters were collected, including creatinine levels. Details of the NOAC charted, the dose and indication, as well as the presence of concomitant anticoagulants and anti-platelets were recorded for each patient.

RESULTS

Among 67 patients, the mean age was 74.42 years. Prevention of stroke in atrial fibrillation (82.1%) was the most common indication for NOAC therapy, with apixaban the NOAC of choice in 46.3% of the cohort. Non-adherence to Australian therapeutic guidelines, as set by product manufacturers was found in 17 patients (25.4%) with a total of 19 reasons for non-adherence. The most common reason, found in 8 patients, was not meeting the approved indications. In other instances, 6 patients were charted lower doses than recommended by the guidelines, 3 patients had contraindications due to poor renal function, and 2 had a larger than recommended dose prescribed. Concomitant anti-platelet medications were also examined, with 13.4% of patients on aspirin and 7.5% on clopidogrel. Furthermore, 7 patients (10.4%) were prescribed both a NOAC and either VTE prophylaxis or therapeutic anticoagulation.

DISCUSSION

Significant non-adherence to therapeutic guidelines is a reflection of uncertainty amongst prescribers, suggesting the need for pharmacist-led educational programs. Continued monitoring of prescribing patterns may contribute towards increasing knowledge and insight into NOACs; their benefits and risks in a clinical setting.

Perceptions and attitudes towards type 2 diabetes and its medication(s)- a qualitative study in diabetic patients of Nepalese origin

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INTRODUCTION

Chronic diseases such as diabetes affect people in different ways. Patients' perceptions and attitudes towards their disease and medications significantly influence their overall treatment adherence. This qualitative study explored Nepalese patients' perspectives about their diabetes and medication taking.

METHOD

In-depth face-to-face interviews were conducted with 18 adults of Nepalese origin with type 2 diabetes, residing in Sydney. All interviews were audio recorded, transcribed verbatim and thematically content analysed using constant comparison approach.

RESULTS

Stress, shock, anxiety, fear and disappointment, particularly for not being able to 'eat' were the most commonly reported feelings towards diabetes when first diagnosed. A gradual change in attitudes were reported with better understanding of the disease, "normalising" of diabetes, and through acceptance of the condition and its lifelong nature. There was a general reluctance to start allopathic medication(s), but opt for alternative treatments such as herbs and "traditional" medicines. Unwillingness towards taking allopathic medications was mostly because of the societal belief that once started these medications needed to be taken for life, and their perceived harm of in the long term. Reinforcement from doctors about the importance of medications for diabetes was the primary reason motivating adherence to pharmacotherapy.

CONCLUSION

Patients' knowledge and understanding about their disease influenced how they coped with their diagnosis. Education could, therefore, be the first step towards better diabetes management. Belief in their doctors rather than medications directed patients' behaviour towards their anti-diabetic therapy; strengthening this relationship could be key to improving medication taking behaviour in this population.

Service user priorities for people with chronic conditions, and carers: a comparison with pharmacy staff

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INTRODUCTION

With the increasing prevalence of chronic conditions and the encouragement for health professionals to meet consumer needs in a patient-centred manner, it is important to explore what consumers prioritise from pharmacy services, and how well pharmacy staff understand these needs.

AIM

To investigate what people with chronic conditions and carers prioritise in terms of ideal community pharmacy services, and compare this with what pharmacy staff believe they want.

METHODS

Groups using the Nominal Group Technique were undertaken in four Australian regions between December 2012-April 2013. Separate groups were held for pharmacists, support staff, and consumers and carers. The top five priorities were identified for each group and thematic analysis provided further contextual insight.

RESULTS

Of the 21 nominal groups, 15 involved consumers and carers ($n=103$), four pharmacist ($n=22$), and 2 support staff groups ($n=13$). Pharmacy staff generally understood what consumers and carers wanted in terms of access, affordability, patient-centred and continuity/coordinated care. The exception was information and education, which was prioritised by 12/15 consumer and carer groups, but only one pharmacist group. Pharmacy staff allocated innovative services and roles as their first priority.

DISCUSSION

Pharmacy staff generally understood consumer and carer priorities. This study underscores the importance of pharmacy staff optimising counselling procedures in their everyday practice, as well as capitalising on these priorities to improve patient care.

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A discrete choice experiment to elicit preferences of consumers with chronic conditions and carers for the delivery of community pharmacy services

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OBJECTIVE

To evaluate the preferred characteristics of pharmacy services to help manage chronic condition(s) from a consumer and carer perspective, and compare these to health professional beliefs about ideal service characteristics.

METHOD

Australian consumers with chronic condition(s) and/or carers (n=602) and health professionals (n=297) completed a discrete choice experiment. Each participant responded to four (from 72 different) choice scenarios in which they chose between two new pharmacy services, differing by six service characteristics related to continued medicines supply, continuity and coordinated care, location, medication management, education and information, and cost.

RESULTS

Continued medicines supply by a pharmacist was the highest priority for consumers and carers. A pharmacy located within a 'one-stop' health centre and home delivery of medicines were also important service characteristics. Health professionals perceived pharmacy location (rather than continued medicines supply) to be the most important characteristic for consumers. Almost half of consumer and carer participants (n=288; 47.8%) selected their current rather than a new pharmacy service in all four scenarios; the main reasons for doing so related to the provision of person-centred services that were easily accessible and responsive to individual needs.

DISCUSSION

When planning pharmacy services to best assist consumers to manage chronic conditions, the provision of continued medicines supply (e.g. through pharmacist prescribing), as well as convenient and coordinated care (e.g. delivered through a one stop health centre and home delivery of medicines), should be prioritised. However, a person-centred approach to care remains an essential characteristic of pharmacy services.

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Transactivation-dependent GPCR signalling in cardiovascular disease

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Seven transmembrane G protein coupled receptors (GPCRs) represent the largest group of therapeutic targets in medicine. Two decades ago it was discovered that GPCRs could transactivate protein tyrosine kinase receptors (e.g. Epidermal Growth Factor Receptor -EGFR) and our laboratory recently discovered that GPCRs can also transactivate serine/threonine kinase receptors (e.g. the Transforming Growth Factor receptor Type I -TGF β RI). In our *in vitro* model of atherosclerosis, being the synthesis of the lipid-binding proteoglycan, biglycan, all of the signalling from the thrombin receptor, Protease-Activated Receptor (PAR)-1, occurs via transactivation-dependent pathways¹. Experiments supporting this contention will be described.

Experiments were conducted in human vascular smooth muscle cells (VSMCs) with analyses by radiosulfate incorporation, SDS-PAGE, Western blotting with anti-phospho antibodies and analysis of mRNA expression for biglycan and glycosaminoglycan (GAG) synthesizing genes (C4ST-1 and ChSy-1).

Thrombin stimulated an increase in phosphoErk (from EGFR) and phosphoSmad2C (from TGF β RI). Thrombin stimulated the incorporation of radiosulfate into biglycan secreted by VSMCs and stimulated the expression of genes associated with elongation of GAG chains on biglycan. These responses were blocked by the EGFR antagonist, AG1478 and the TGF β RI antagonist, SB431542 and together both antagonists blocked all of the response.

These results demonstrate that thrombin signalling for proteoglycan synthesis in these cells proceeds via transactivation-dependent pathways. GPCR transactivation signalling may be much more important than previously appreciated. The challenge will be to identify a common mechanism of transactivation-dependent signalling which can be exploited as a novel therapeutic target.

¹Burch, M. L. *et al.*, *Journal of Biological Chemistry* 288: 7363-7372 (2013).

Investigation of compounds in *Carica Papaya* Leaf extracts with cytotoxic activity on human squamous cell carcinoma cells using liquid chromatography-quadrupole time-of-flight-mass spectrometry

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METHODS

In this study, we investigated the *in vitro* cytotoxicity of aqueous and ethanolic extracts of *Carica papaya* leaves on the human oral squamous cell carcinoma SCC25 cell line in parallel with non-cancerous human keratinocyte HaCaT cells. The chromatographic and mass spectrometric profiles of the extracts obtained with Ultra High Performance Liquid Chromatography-Quadrupole Time of Flight - Mass Spectrometry were used to tentatively identify the compounds responsible, using comparative chemometric analysis. Phenolic and flavonoid contents of the extracts were also determined using colorimetric methods.

RESULTS

Two out of four extracts showed a significantly selective effect towards the cancer cells and were found to contain high levels of phenolic and flavonoid compounds. The principal compounds identified were flavonoids or flavonoid glycosides, particularly compounds from kaempferol and quercetin families, of which several have previously been reported to possess anticancer activities.

DISCUSSION

The healing capabilities against cancer of *Carica papaya* leaf have been reported in traditional medicine of many different countries. The use of various forms of papaya extract for the treatment of several skin diseases has also become widespread with *in vitro* and *in vivo* scientific validation. In this study, the selective cytotoxicity of *Carica papaya* leaf extracts on squamous cell carcinoma cells, compared to non-cancerous keratinocytes, was demonstrated. This cytotoxic activity was mainly associated with the presence of flavonoid compounds. Our results contribute scientific basis to validate the traditional use of *Carica papaya* leaf for cancer treatment.

Investigation of polycaprolactone matrices for the sustained intravaginal delivery of proteins

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METHODS

Lactoferrin, as a model protein, was incorporated in polycaprolactone (PCL) matrices by using rapidly cooling suspensions of the protein powder in acetone solutions of PCL. Daily and cumulative release amounts of the protein were determined in simulated vaginal fluid (SVF) by HPLC. The stability of the protein in the PCL was investigated using differential scanning calorimetry (DSC). Morphology of the protein loaded matrices was checked with scanning electron microscopy. The potential for cell toxicity or irritation of the released material will be tested using a vaginal cell line.

RESULTS

After 14 days immersion in SVF the PCL matrices loaded with 5%w/w and 10%w/w of lactoferrin released 88% and 95% of the lactoferrin respectively. The HPLC chromatogram for released protein was the same as standard protein indicating that the protein is stable during the manufacture process; this was further confirmed by DSC.

DISCUSSION

Intravaginal rings are polymeric devices that can be used for sustained and controlled drug delivery through the vaginal route. One of the major challenges for protein delivery through the vaginal route is the stability of proteins during the manufacturing process as the polymers in current use have very high processing temperatures; PCL matrices are prepared at 45°C These findings indicate that the PCL could be a potential polymer for the intravaginal delivery of protein/peptides but further experiments are required to test the compatibility of these polymers for human use.

Therapeutic potential of tea tree oil for scabies: a review

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This study summarises the use, efficacy and limitations of current scabicides and current knowledge on the use of tea tree oil for the treatment of scabies.

METHODS

Bibliographic index searches were conducted using MEDLINE, Web of Science, Scopus, Google Scholar and SciFinder Scholar. Additional references were identified in an ad hoc manner from the bibliographies of the publications identified in the primary search.

RESULTS

A review of the literature demonstrates the emergence of resistance towards scabicides. Further evidence shows the lack of effectiveness of currently available scabicides in reducing the inflammatory skin reactions and pyodermal progression in predisposed patients. Tea tree oil has demonstrated promising acaricidal effects against scabies mites *in vitro* and has also been successfully used as an adjuvant treatment for crusted scabies.

DISCUSSION

Emerging acaricide resistance threatens the future usefulness of currently used gold standard treatments (oral ivermectin and topical permethrin) for scabies. The imminent development of new chemical entities is doubtful, and research and development in this area does not appear to be a priority for pharmaceutical companies. Tea tree oil formulated for topical use would have the added advantage of being economical, simple to use and could be implemented in remote communities as a traditional medicine for the long-term management of scabies and pyoderma in children. The cumulative acaricidal, antibacterial, antipruritic, anti-inflammatory and wound healing effects of tea tree oil may have the potential to successfully reduce the burden of scabies, as well as the associated bacterial complications that can accompany it.

Development of nicotine-loaded chitosan nanoparticles for pulmonary delivery from dry powder inhaler formulation

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METHODS

The aim of this study is to develop nanoparticles of biodegradable polymer (chitosan) loaded with nicotine for pulmonary delivery from dry powder inhaler (DPI) formulation. The nicotine-loaded polymer nanoparticles were prepared using a W/O emulsion crosslinking method. The prepared nanoparticles were characterized using scanning electron microscopy (SEM) for morphological studies, Malvern zetasizer for particle size analysis, and differential scanning calorimetry (DSC) for thermal analysis. The *in vitro* aerosolization of the formulation was studied using a twin-stage-impinger (TSI).

RESULTS

The particles were spherical and average particle size was 135.2 ± 4.2 nm. The DSC thermograms confirmed nicotine dissolved in chitosan and also loaded into the chitosan matrix as crystals. The *in vitro* aerosolization study produced fine particle fraction (FPF) of 20.6%. Formulated nicotine nanoparticles achieved the relatively high drug loading (65.9%) and entrapment efficiency (98.3%), and the maximum cumulative release was around 70% in 7 days.

DISCUSSION

Using a biodegradable polymer, chitosan, nicotine has been successfully loaded for *in vitro* lung delivery with a controlled release profile. The developed DPI formulation produced FPF of 20.6%, which is comparable to currently available DPI products. According to the drug release profiles, the drug was rapidly released from the nanoparticles initially due to the rapid dissolution of surface adhered/entrapped drug, followed by slower release because of the penetration of the PBS release medium into the nanoparticles and dissolution of the entrapped drug.

High-throughput assay for simultaneous quantification of the plasma concentrations of thiopental and pentobarbital using automated solid phase extraction coupled to LC-MS/MS

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Thiopental and pentobarbital are short-acting barbiturates and commonly used as intravenous induction agent for general anaesthesia. The aim of this study was to develop and validate an on-line solid phase extraction method to measure the analytes of interest in plasma samples collected from patients on extracorporeal membrane oxygenation.

METHODS

To aliquots of human plasma (50 µL), internal standards (thiopental-d5, 50 µL) and 0.5% formic acid in water (150 µL) were added and samples were loaded on C18 cartridges which were then washed using 10% methanol in acetate buffer (50 mM, pH=7) before elution with mobile phase comprising 0.1% formic acid in water, and acetonitrile with a flow rate of 0.55 mL/min using a 7.2 min run time. A C18 XTerra® was used as analytical column, and detection was performed using a QTrap 5500 mass spectrometer (AB Sciex) with negative ionspray ionisation.

RESULTS

The method showed acceptable within-run and between-run precision and accuracy (>87.1%) for quality control (QC) samples (n=6, at three different days). Analytes were stable for at least 36 h in the autosampler, after three cycles of freeze and thaw, and after 3 h at room temperature. The recovery was 101% (thiopental) and 83% (pentobarbital). Matrix effect was tested using spiking low and high concentrations of analytes in plasma samples from 6 individuals (precision > 92.2%).

DISCUSSION

Previous assays for thiopental and pentobarbital were using GC or HPLC. This is the first fully validated high-throughput LC-MS/MS assay method based on EMEA guideline for Bioanalytical Method Validation (Feb 2012).

Solubility studies of ibuprofen in aqueous ethanol co-solvents at high water contents

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The solubility of a pharmaceutical compound is vital to understand the design and optimisation of crystallization processes, drug formulation and delivery systems. Ibuprofen, a poorly water soluble drug is widely used for analgesic and antipyretic therapeutic actions and information on its solubility in aqueous solvents (especially in high aqueous ethanol) is limited. The aim of this study is to investigate the solubility of ibuprofen in aqueous ethanol co-solvent systems to optimize the crystallization technique for manufacturing drug particles with a desired size range.

The solubility of ibuprofen was measured in water (W) - ethanol (E) mixtures from 0 to 50% w/w, E/(E+W) at 10, 25 & 40 °C by the dissolution method using UV spectrophotometry to determine the solution concentrations.

The UV calibration for different water - ethanol mixtures showed Beer - Lambert linearity; however, the slopes differed which indicated the structure of the drug is influenced by the solvent system i.e., the ratio of water and ethanol composition. Ibuprofen solubility in E/(E+W) (0 - 50% w/w) solvents at 10 and 25 °C increased near logarithmically with ethanol content. At 40 °C, phase separation above 33% w/w E/(E+W) mixtures limited observations.

The solubility of ibuprofen in high aqueous ethanol has been determined. The solubility study will be used to select precipitation crystallizer conditions to produce free flowing ibuprofen particles (<5 micron) for developing a DPI formulation for lung delivery.

Enhanced solubility and dissolution rate of gatifloxacin by solid dispersion technique

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Gatifloxacin (GTX) is a fourth generation broad spectrum fluoroquinolone used to the treatment of ocular infections like conjunctivitis. Although it is available as Zymar eye drops, the problem with its use is its tendency to recrystallise post-administration at neutral pH due to poor water solubility. Solid dispersion (SD) technique is the most effective method for improving the solubility of poorly water-soluble drugs. This study aimed at improving the solubility and dissolution rate of gatifloxacin using solid dispersion technique.

METHODS

Gatifloxacin (SDs) were prepared via the solvent evaporation and freeze-dried method. A 1:1, 1:2 and 1:3 of drug to polymer ratios of the SDs were prepared. The selected polymers were PEG-6000, HPMC and PVP. Differential scanning calorimetry (DSC), fourier transform infrared (FT-IR) spectroscopy were used for characterization of the SDs. Additionally, the solubility and the dissolution rate of the prepared gatifloxacin SDs were explored.

RESULTS

The SDs with greatest improvement in gatifloxacin's solubility were the 1:1 drug to polymer ratio, with HPMC followed by PVP and PEG-6000. 1:1 SD of PVP showed the most improvement in dissolution rate followed by HPMC and PEG-6000. DSC thermograms showed changes in the melting peak of gatifloxacin when prepared as SDs, which suggest a change in crystalline structure of the drug.

DISCUSSION

Through the use of solid dispersion technique the solubility and dissolution rate of gatifloxacin were improved. The results suggest that selection of the polymer is of crucial importance as the polymer has its unique physicochemical properties governing its interaction with gatifloxacin and the effect on improving its the solubility and dissolution rate.

Preparing community pharmacists for a role in mental health: an evaluation of accredited Australian pharmacy programs

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BACKGROUND

The mental health education that pharmacy students receive during their qualifying degree programs sets the foundation for their professional roles in supporting mental health consumers and carers.¹ To determine how graduates were being prepared to assist mental health consumers and carers, an evaluation of the mental health content of accredited Australian pharmacy qualifying programs was undertaken.

METHODS

Between January and July 2012, publically available online profile information for accredited degree programs was reviewed, and program coordinators from the 18 accredited pharmacy degree programs providers in Australia² were surveyed.

RESULTS

Online survey data from program convenors who provided information about the delivery of mental health content in their pharmacy programs supported information gained from the review of program profiles. Mental health education within pharmacy degree programs was embedded in core subjects such as pharmacology, pharmacotherapy and pharmacy practice. Mental health teaching was delivered using various modes including lectures, workshops, and experiential learning. While education was intended to align with expected levels of pharmacists' professional competencies,¹ there was lack of national standardised outcome-based competency criteria for new graduates and wide ranging inter-program variations were evident.

DISCUSSION

A lack of standardised content in pharmacy qualifying programs that underpin pharmacists' mental health knowledge and skills might result in variations to practice competencies. Further research is needed to determine how variations impact the way pharmacists deliver care to mental health consumers and their caregivers.

ACKNOWLEDGEMENT

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Recognition of an advanced pharmacist practitioner – lifelong learning journey

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BACKGROUND

During the review of the National Competency Standards for pharmacists in 2010, the desirability of undertaking work directed at gaining recognition for advanced pharmacy practice in Australia was identified. At the time, the Advanced Pharmacy Practice Framework Steering Committee (APPFSC) was formed with nominees from each of the pharmacy professional organisation. On behalf of the pharmacy profession in Australia, this steering committee developed the Advanced Pharmacy Practice Framework (APPF). Advanced pharmacy practice in Australia will be formally assessed against the APPF.

In December 2013, the Australian Pharmacy Council was endorsed by the member organisations of the APPFSC as the independent credentialing body for advanced practitioners.

OBJECTIVES

To build a credentialing process using a profession-wide initiative that illustrates unity and collaboration between the pharmacy professional bodies with the aim to support continued engagement and development of an individual's lifelong learning journey.

METHODS

At present, the APC is developing the credentialing process via public consultation, which will be followed by a pilot early 2015. In May 2014, the first draft of credentialing evaluation standards, policies and processes were released for public comment.

RESULTS

The feedback was considered at a meeting of the APCC in July 2014. There were number of themes apparent throughout the feedback.

DISCUSSION

The poster will highlight the credentialing evaluation standards, policies and processes and the number of themes apparent through the first round of consultation together with the recommendations from the APCC on how the identified issues should be addressed. It will also include outcomes of the second draft of credentialing evaluation standards, policies and processes, released for public comment in October 2014.

Exploring access to medicines and pharmacy services for resettled refugees

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METHODS

Adhering to guidelines for systematic reviews by PRISMA, this review synthesised findings of research that explored the barriers and/or facilitators of access to medication and pharmacy services for resettled refugees. Databases were searched during March 2014 and included Scopus, ProQuest Sociological Abstracts, PubMed, Embase and APAIS Health. The Australian and International grey literature was also explored.

RESULTS

Out of 651 potentially relevant articles, 9 studies met quality and inclusion criteria. The research reported in 7 of the 9 studies was conducted in the United States, 1 was conducted in Australia and the other in the United Kingdom. The majority of studies focused on Southeast Asian refugees. Themes identified across the studies included language and the use of interpreters; navigating the Western healthcare system; culture and illness beliefs; medication non-adherence; use of traditional medicine; and family, peer and community support.

DISCUSSION

The difficulties that resettled refugees experience in accessing primary healthcare services have been widely documented. In most developed countries, pharmacists are often the first healthcare professional contacted by consumers; however, the ability of refugees to access community pharmacy and medication may be limited. This review indicates a significant paucity of published research exploring barriers to medication and pharmacy services among this vulnerable population. Findings from the international literature suggest that refugees experience barriers to medication access, including language and cultural barriers, and experience difficulties navigating the pharmacy healthcare system. This review highlights the need for appropriate interpreting and translation services, as well as pharmacists demonstrating effective cross-cultural communication skills.

Distal limb wound healing in horses – is there a role for topical compounds?

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BACKGROUND

Distal limb wounds heal slower than wounds on other parts of the horse because second intention repair is subjected to numerous complications. Possible causes include: predisposition for bacterial wound contamination; decreased blood supply, high motion due to the presence of highly mobile joints, relative deficiency of soft tissue coverage and consequently a scant vascular bed.

METHOD

A comprehensive review of the literature was undertaken to identify key issues in wound healing for distal limb wounds in horses and to identify topical compounds which may enhance and promote wound healing. Human and animal wound healing literature was reviewed to draw on the widest evidence.

RESULTS

The results show that a variety of treatments are currently used for wound healing in horses. These include anti-inflammatories, antibiotics and zinc-based treatments. More recently, agents utilized in wound healing including honey, curcumin and silicone-based compounds have been applied to humans with varying benefits. However, silicone-based compounds and curcumin appear to have positive effects on healing.

DISCUSSION

Evidence suggests that compounds used in human wound healing like silicone-based dressings may assist in promoting wound healing in horses. Additionally, other compounds including curcumin appear to accelerate wound healing, reduce the production of over-granulation tissue and reduce scarring leading to an improved outcome. Comparative trials, verse standard care, in horses are needed to determine the clinical potential of these compounds.

Comparison of self-reported medicine use with the pharmaceutical claims database in patients with osteoarthritis

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AIM

To investigate the correlation between self-reported medicine use and dispensing data obtained from the pharmaceutical claims database and determine whether the correlation changes over time or if it is affected by an individual participants pill burden.

METHODS

This report is a secondary analysis of results from a randomised controlled trial – the Management of Osteoarthritis (MOA) trial. Self-reported medicine use obtained during the MOA trial was matched by patient NHI (national health index) number and compared to the data contained in the pharmaceutical claims database.

RESULTS

70% of participants reported the same medicine information that was recorded in the pharmaceutical claims database. When excluding those who had no medicines to report, 59% reported the same medicines as recorded in the database. Participants with a drug burden of 0 to 4 medicines were most accurate at recalling the medicines they had been dispensed. Paracetamol was the most commonly used medicine followed by glucosamine. Of those using opioids, codeine was most common followed by oxycodone.

DISCUSSION

This comparison of self-reported medicine usage versus medicine use information obtained by a pharmaceutical claims database found that neither method of obtaining this information is perfect. It is possible that the most accurate way to gather information about a patient's medicine use would be to use a combination of both methods. Many patients with osteoarthritis are using treatments recommended by guidelines but significant numbers use medicines and complementary therapies that are not supported by strong evidence.

Exploring the perceptions of clinical pharmacists and junior medical officers on the use of the Medmap form as a documentation tool for adherence assessment

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Optimising patient's medication adherence is pivotal to ensuring treatment effectiveness; several studies have explored methods to improving adherence. However, to date no studies have explored the adequacy of adherence assessment documented on the MedMAP form by hospital pharmacists. The aim of the study was: (i) to explore the perceptions health professionals have regarding use of the MedMAP form for documentation of adherence assessment in a South Australian public hospital (ii) trial a modified MedMAP form with the aim of improving clinical pharmacists' confidence in the non-ambiguity of adherence assessment.

METHODS

The study was based at The Queen Elizabeth Hospital, Adelaide, South Australia. Qualitative research methods were employed in this study and qualitative data were analysed thematically. Findings influenced modifications made to the MedMAP form which was then trialled over a period of 2 weeks.

RESULTS

Findings indicated that junior medical officers valued, but underutilised, documented adherence assessments. The study identified the limitations of the MedMAP form which required attention. Feedback from the trial of the modified form was positive, but the study was unable to prove that the modifications made to the form reduced its vulnerability to ambiguous documentation.

DISCUSSION

Study of the clinical pharmacists' and junior medical officers' perceptions suggest the need for further improvement to the MedMAP form. As the feedback regarding the modified tool was positive, its use as an alternative to the MedMAP form could be considered. Future initiatives should also be focused on orientating medical officers to the issue of underutilisation of adherence information.

Multi-disciplinary management of metabolic risk in community-dwelling mental health patients

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INTRODUCTION

A unique 'metabolic clinic' has been established in Craven's Pharmacy, central Perth, employing a nurse practitioner to manage risk factors in, and prescribe for, mental health patients. The service is funded by an independent benefactor. This study is an independent evaluation of the service since its introduction in November 2013, using a customised framework.

METHODS

The evaluation framework was derived with reference to best-practice standards for community pharmacy. Qualitative interviews were conducted with all staff members involved in the service, and were recorded (with consent), transcribed and analysed. De-identified patient biometric data were accessed to identify progress and clinical outcomes.

RESULTS

The evaluation framework comprised process, quality and outcome indicators. Eight staff were interviewed, explaining their contribution to identification, enrolment and clinical management of patients. Patients were identified for the service by their psychiatrists or in-store consultation. The nurse practitioner provided the majority of clinical input in line with her scope of practice, with pharmacists providing medication management and counselling. Interventions comprised weight, blood pressure, blood glucose and lipid management, and smoking cessation. A number of patients demonstrated clinical improvement in biometric markers. The main challenge was the stand-alone software utilised by the nurse practitioner and pharmacists.

DISCUSSION

The evaluation framework may be applied to other disease management services. While this evaluation did not determine financial viability of the service, the key process, quality and outcome indicators were met, and positive clinical outcomes position the service to be sustained and expanded.

ACKNOWLEDGEMENT

Staff of Craven's Pharmacy, Perth.

Formulation and evaluation of spiramycin in pharmaceutical dosage forms

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Spiramycin is a drug of poor flowability, fluffy, sticky and with unpredictable absorption in humans. The aim of this study was to overcome the physical problems of spiramycin, then to formulate the drug powder in dosage forms with lower production costs and better bioavailability.

METHOD

Capsules: 20 spiramycin powder and granule formulae were used to prepare capsules and evaluated for flowability, content uniformity and dissolution rate.

Effervescent granules: 10 formulae were prepared using citric acid, tartaric acid and sodium bicarbonate, and evaluated for their physical characteristics and effervescent cessation time. These ten formulae are then filled in capsules and evaluated for their content uniformity and their dissolution and the kinetics of their dissolution.

Chewable tablets: The best three formulae of granules and effervescent granules were taken and formulated as chewable tablets, and evaluated for flowability, weight variation, thickness and diameter, content uniformity, friability, hardness, dissolution pattern in 0.1 N HCl and in phosphate buffer at pH= 6.8, and stability under accelerated conditions (40°C for 3 months).

Emulgels: 8 medicated emulgels were prepared and evaluated by visual inspection, then tested for drug content, pH, rheological properties, *in vitro* spiramycin permeation and release. The emulgels also underwent microbiological testing against *Staphylococcus aureus* and *Escherichia coli* strains.

RESULTS

Spiramycin was formulated in four different forms: capsules, effervescent granules, chewable tablets and emulgels. A product for each form was identified that had suitable pharmaceutical properties to progress to clinical trials.

DISCUSSION

These formulae can provide improved or unique clinical benefits, such as improvement of patient compliance, improving patient acceptance of the treatment, especially for elderly, and finally providing an opportunity for a line extension in the market place.

Teaching of pharmacogenomics in Australian pharmacy schools

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METHODS

This exploratory study was designed to assess the extent of pharmacogenomics (PGx) teaching in Australian Pharmacy schools via a web-based survey. The survey consisted of 'check boxes' or 'fill in the space' questions with additional space at the end for written comments.

Ethics approval for this study was granted by the Human Research Ethics committee at the University of South Australia.

RESULTS

A representative from 12 out of 17 (71%) Australian Pharmacy schools provided a valid response to the survey. 11/12 (92%) respondents had a PhD and half of them had more than 10 years of teaching experience. 50% of respondents had PGx research interests. PGx teaching was mainly delivered in the 3rd and 4th years of the degree (8/12, 66.7%). 25% of the respondents were familiar with the Clinical Pharmacogenomics Implementation Consortium (CPIC) dosing guidelines.

DISCUSSION

All respondents indicated that PGx teaching is important to future pharmacists and PGx will have an impact on future practise. However, there appears to be poor awareness of the CPIC guidelines, and not all schools teach their students about the PGx of drugs that have specific PGx testing requirements for access through the PBS. This gap in PGx teaching needs to be addressed at a national level so that future pharmacists are competent in tackling PGx issues in practice. (Word count: 217)

Development of a questionnaire to measure consumers' perceptions of service quality in community pharmacies

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INTRODUCTION

Community pharmacies have a unique role of providing healthcare services while also operating as a retail business. The aim of this research was to develop an instrument to measure consumers' perceptions of service quality in community pharmacies.

METHODS

Theoretical conceptualisation of the dimensions of pharmacy service quality was initially performed. Item generation was then undertaken, incorporating; items from a validated questionnaire in the medical setting, items identified via systematic review of pharmacy service quality literature, supplemented with quotes from semi-structured interviews of pharmacy consumers. Content validity was then conducted in 2 rounds with an expert panel of pharmacy academics (n=3). Finally, face validity of the questionnaire was determined with a convenience sample of consumers (n=9).

RESULTS

Four primary dimensions of pharmacy service quality (interpersonal, technical, environmental and administrative), and 13 sub-dimensions (interaction, relationship, availability, friendliness/helpfulness, patient health outcome, expertise, advice, institutional trust, atmosphere, tangibles, timeliness, organisational efficiency and additional services) were identified. An initial 113 item questionnaire was refined through the validation process to 61 items; 12 items measuring 4 primary dimensions and 49 items measuring 13 sub-dimensions. Questionnaire responses use a 7-point Likert-type scale; from strongly disagree to strongly agree.

DISCUSSION

A methodologically rigorous and theoretically grounded approach has resulted in an easy-to-use questionnaire that will allow exploratory and confirmatory factor analysis of results to be undertaken. Use of this questionnaire may result in the optimisation of how community pharmacy services are delivered.

“Don’t be a sooky la-la”: How are health issues managed in Western Australia’s mining sites?

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INTRODUCTION

Western Australia’s mining sector is characterised by nearly 60,000 transient employees. The remoteness of mining communities, and their high-risk work environments and reliance on limited on-site medical services, is of concern in the provision of healthcare for mining workers.

METHODS

Qualitative interviews were conducted with 20 mining/drilling operation employees identified through contacts and referrals. The interview guide explored medication-related incidents, medical emergencies and health management policies and procedures in employees’ workplaces. Participants reflected on their experiences and recalled anecdotes involving colleagues. Interviews were recorded with consent, transcribed, and descriptively reported.

RESULTS

Participants comprised two off-shore rig workers, 13 land-based transient workers, and five Perth-based site visitors. Medical staffing at work sites was commonly limited to one or more paramedics and/or nurses, with reliance on the Royal Flying Doctor Service for medical evacuation or land transport to regional hospitals where feasible, and visiting allied health services. Anecdotes relating to medication issues included workers forgetting to bring medicines to site or having insufficient supplies for their length of stay, sharing of medicines, and misuse of medicines. Limited medication supplies on-site were supplied via telephone authorisation from affiliated prescribers. Employers were accommodating of workers with medical conditions, although a ‘harden-up’ culture was evident amongst workers, evidenced by their reluctance to report minor conditions to avoid investigations and paperwork.

DISCUSSION

This research has generated further investigation of potential roles for pharmacists to address the medication needs of remote workers.

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Engagement of community pharmacies in a multi-centre education-focussed intervention

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INTRODUCTION

Under the Fifth Community Pharmacy Agreement, research was commissioned to enhance capacity in community pharmacy to identify and manage consumers with varying levels of health literacy. We report our experiences with engaging the participating pharmacies in a unique project design.

METHODS

Informed by educational literature, our research comprised an education-focussed intervention delivered to participating pharmacies via face-to-face or electronic training. A control group received no intervention. One or two key staff members from each intervention pharmacy participated in a 'train-the-trainer' approach, and were allowed flexibility in training their remaining staff. The modules were designed for comprehensibility by all staff, and included interactive and reflective elements. A target of 528 consumers, from 90 pharmacies across three states, was statistically determined. Recruitment strategies to engage rural and metropolitan pharmacies included advertisements and contact with all pharmacies in identified regions.

RESULTS

77 pharmacies expressed interest in participating; 14 withdrew for logistical reasons. 23, 17 and 23 pharmacies completed face-to-face, electronic, and no training, respectively. The 'trained trainers' and 'trainees' were eligible to claim continuing professional development. Greater engagement with the project was noted with face-to-face delivery, although electronic delivery offered accessibility. In-pharmacy training varied from inclusion of modules in staff meetings to intensive block sessions.

DISCUSSION

Engaging community pharmacy staff in an educational intervention underpinned by research presented challenges similar to other intervention projects. Incentivising staff to undergo training and train other staff was deemed successful, and offers a mechanism for nationwide skills development.

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Fifth Community Pharmacy Agreement.

Formulation and stability of oral liquids – an evolving research and skill base in compounding

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BACKGROUND

The lack of commercially available oral liquids is an ongoing problem for health care providers in many practice settings. Pharmacists are often challenged to provide extemporaneous oral liquids to meet specific patient requirements.

METHODS

This study examined new stability data of extemporaneous oral liquids since the previous review published in 2006. A review protocol was developed with data identified from MEDLINE, EMBASE, Informit, Google Scholar and reference texts related to the field. Searches were current as of July 2014.

RESULTS

The review included 42 examples of extemporaneous oral liquids prepared by altering commercial medicines, including the methods, excipients and outcomes of the physical and chemical stability studies. This review presents more complex stability issues, where investigators have proposed the inclusion of specific excipients to address stability problems identified in the past, including: the pH adjustment of lansoprazole oral liquids by addition of NaHCO₃; the inclusion of antioxidants in mercaptopurine oral liquid; the addition of povidone K-30 to prevent crystal growth, and citric acid to optimise pH in temozolomide oral liquid; and the adjustment of storage conditions to prevent enantiomeric conversion of clopidogrel.

DISCUSSION

The research and skill base in compounding has evolved since the previous review and many improvements have been made to address the various formulation and stability issues in preparing extemporaneous oral liquids from commercially available products. This improved understanding of the role of excipients in the stability of oral liquids will allow pharmacists to meet the challenge of addressing the needs of patients requiring oral liquids.

Increasing the sensitivity of LC-MS-MS analysis of vitamin D and its metabolites

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Liquid chromatography-tandem mass spectrometry (LC-MS-MS) is a very powerful approach for the analysis of vitamin D compounds; however, poor ionisation efficiency of vitamin D compounds leads to reduced sensitivity. Although derivatisation has been used to improve ionisation, it has not been optimised for the major forms of vitamin D. Ion suppression can also reduce the mass spectral responses.

METHODS

The derivatisation reactions between 4-phenyl-1,2,4-triazoline-3,5-dione (PTAD) and vitamins D₂, D₃ and their metabolites 25OHD₂ and 25OHD₃ were optimised: the molar ratio of PTAD:vitamin was varied from 5 to 30000, and the reaction time varied from 1 to 16hrs. LC-MS-MS analysis was also optimised using a C18 column and solvent gradients. Multiple reaction monitoring (MRM) conditions were optimised for each analyte. Peak areas were used to assess the efficiency of each set of conditions.

RESULTS

By changing gradient conditions, an optimum run time of 20 min was found sufficient to achieve the highest peak areas. The optimal derivatisation was achieved using a PTAD:vitamin molar ratio of 10000:1 and the time of reaction of 1 hr. The detection sensitivity of vitamin D compounds was enhanced 9-12 fold.

DISCUSSION

Increasing the retention time of vitamin D-PTAD compounds was crucial to minimise the suppression of vitamin D peaks by excess PTAD. The optimisations reported resulted in a sensitive vitamin D method that can be used to determine vitamins D₂, D₃, 25OHD₂ and 25OHD₃ in complex matrices at trace levels.

Research in hospital pharmacy: an analysis of stakeholders needs

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METHODS

This study explored Australian ward-based hospital pharmacists' (WBPHs) and Chief Pharmacists' (CPs) beliefs and attitudes towards conducting research and the barriers and enablers they may experience throughout the research process. A nationally distributed quantitative online survey was completed by WBPHs and semi-structured face-to-face qualitative interviews were conducted with nine CPs from the Perth metropolitan area. Thematic and quantitative analysis was undertaken.

RESULTS

Both groups showed an overwhelming belief that research is an important and positive part of hospital pharmacy practice. A lack of adequate resources (funding, personnel) and time during the working day were the major barriers identified. Enablers such as increased professional collaboration and the development of a research plan were considered by participants to have potential to increase research outputs.

DISCUSSION

This study highlights the need for research to be considered a value-adding activity and to be an integral part of WBHP's practice. Pharmacy departments should establish research partnerships with other hospitals, health disciplines and universities in order to distribute resource burden and improve the quality of research being conducted. CPs should endeavor to 'lead from the front' to encourage WBHP participation in research activities and address educational gaps associated with the research process within their staff. These steps will increase research outputs of Australian hospital pharmacists, leading to positive outcomes for many stakeholders.

Synthesis and characterisation of sterically hindered pyridine based trinuclear platinum anticancer complexes and their cytotoxicity

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BACKGROUND

Multinuclear platinum drugs, such as BBR3464, are of current interest due to their higher activity compared to cisplatin and their retained activity in cisplatin resistant cells. They are however extremely toxic and susceptible to degradation. A current drug undergoing clinical trials, picoplatin, has a sterically hindered platinum centre reducing susceptibility to deactivation and degradation. Combining these strengths could produce highly active drugs that overcome drug resistance, while resistant to deactivation and degradation.

AIM

To synthesise novel sterically hindered pyridine based multinuclear platinum anticancer complexes that are highly cytotoxic in platinum resistant cancer cells and resistant to degradation.

METHOD

The bispyridine ligands were synthesised via a peptide coupling reaction using isonicotinic acids and varying length diaminoalkanes. Reacting with transplatin yielded a range of multinuclear platinum complexes. Characterisation was by standard chemical spectroscopy. Cytotoxicity studies were performed against a panel of cancer cell lines and binding kinetics with biological nucleophiles such as glutathione and human serum albumin.

RESULTS

Multinuclear platinum complexes were synthesised with various variable length bispyridine bridging ligands. Cytotoxicity assays showed high activity against several cancer cell lines and platinum binding kinetics showed decreased reactivity with biological nucleophiles.

DISCUSSION

Sterically hindered multinuclear platinum complexes show potential as anticancer drugs due to their potent anticancer effects and lowered deactivation and degradation.

Anti-cancer effect of *Carica Papaya* leaf juice on colon cancer cells following *in vitro* digestion

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The estimation of cytotoxic and anti-proliferative activity of plant chemical extracts using *in vitro* studies is commonly examined and may over-rate the true *in vivo* anticancer effect. *C. papaya* is a popular tropical plant of the genus *Carica* and family *Caricaceae*. Different parts of papaya in *in vitro* studies showed cytotoxic and anti-proliferative activity against breast, pancreas, lung, liver, leukaemia and haematopoietic cancer cells. The aim of the present study is to investigate the cytotoxic activity of *in vitro* digested (IVD) papaya leaf juice in colon cancer cells.

METHODS

The papaya leaf juice was collected from mature papaya leaves by a hand pressing method using a mortar and pestle. IVD of juice was done in three phases: oral, gastric and intestine. The MTT assay was performed on human colorectal cancer cell line HCT-116 to assess the cytotoxic activity of leaf juice (LJ) and *in vitro* digested leaf juice (IDLJ).

RESULTS

The cell viability was examined at extract dry weight concentrations of 5, 10, 20 and 40 mg/ml papaya leaf. Both LJ and IDLJ extracts at 40 mg/ml concentration displayed a decrease in cell viability of approximately 30% and 17% over HCT-116 cells, respectively. Also, LJ showed significantly higher activity than IDLJ.

DISCUSSION

The cytotoxic activities of both LJ and IDLJ indicate the possibility of bioactive phytochemicals occurring in extracts. However, further work is required to determine whether the high concentrations used have similar cytotoxic effects on non-cancer cells. Furthermore, it appears that the digestion process does not enhance the anti-cancer activity of leaf juice.

Delivering crushed paracetamol tablets using thickened fluids: using *in vitro-in vivo* correlation (ivivc) to make predictions from dissolution tests

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For those who have physiological difficulties with swallowing (dysphagia), medications are often administered with water thickened to an appropriate viscosity. In this study, IVIVC was used to predict the possible *in vivo* drug release profile of crushed paracetamol tablets with thickened water from *in vitro* dissolution test results.

METHODS

In vitro dissolution of whole paracetamol tablets, crushed tablets, crushed with jam, and crushed with thickened water (3 thicknesses) was performed in simulated gastric fluid using USP apparatus. *In vivo* PK parameters for whole paracetamol tablets (the reference product) were used for developing IVIVC for the test products, which was performed using Level A correlation with Winnonlin®.

The % prediction error (%PE) was calculated for PK parameters of the observed (reference) and predicted (test) using the formula below. FDA guidelines recommend %PE < 15%.

$$\%PE = \frac{\text{Observed concentration} - \text{Predicted concentration}}{\text{Observed concentration}} \times 100$$

RESULTS

For whole tablet, crushed tablet, crushed tablet with jam or thickened water at level 150, C_{max} and AUC_{0-∞} were less than 15% PE indicating similarity to the reference (whole tablet). For thickened water at Level 400, AUC_{0-∞} was less than 15% but C_{max} had higher %PE, resulting in less absorption of paracetamol. The thickest thickened water (level 900) had higher %PE for both C_{max} and AUC_{0-∞}, which indicates drug release was retarded.

DISCUSSION

IVIVC predicted a substantial retardation of absorption for crushed paracetamol with thickened water at level 900. The outcome will be compared with results from an associated *in vivo* study using a single dose of the same paracetamol samples.

Application of privacy and confidentiality in community pharmacies: pharmacists' perceptions

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INTRODUCTION

To comply with privacy legislation and confidentiality requirements, pharmacists and pharmacy staff are obliged to maintain confidentiality of patient information. Exploration of challenging practice situations and how breaches occur can facilitate delivery of best practice.

METHODS

A convenience sample of pharmacies in Perth was identified to offer a range of locations, sizes and banner group memberships (including independent ownership). Consenting pharmacists were interviewed. All interviews were recorded and transcribed. This presentation reports pharmacists' perspectives around assurance of privacy and confidentiality in pharmacies.

RESULTS

Twenty-five pharmacists participated. Pharmacists demonstrated consistent understanding of confidentiality requirements, mainly relating to sharing of information (deliberately or inadvertently), but acknowledged uncertainty about how to meet these requirements. Pharmacists recognised that consumers differ markedly in their openness about health conditions and related data. Participants also acknowledged their responsibilities to train staff in privacy and confidentiality procedures, although responses varied in terms of actual delivery of training. Challenges in practice related to visibility at pharmacy counters and overhearing of conversations. Anecdotes relating to breaches of privacy and confidentiality were reported; these breaches were an artefact of the pharmacy setting and more likely in smaller pharmacies.

DISCUSSION

More effective design and use of private consultation areas in pharmacies should enhance pharmacists' ability to meet professional obligations around privacy and confidentiality. Pharmacists would benefit from professional reminders about managing ambiguous situations, continuing education materials reporting recent breaches and discussion of preventive actions. Awareness of consumers' expectations around privacy and confidentiality and potentially embarrassing situations is paramount in professional practice.

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Pharmacists' willingness to conduct rapid HIV testing in community pharmacies

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METHODS

To explore community pharmacists' willingness to undertake rapid HIV testing (RHT) in their practices a national, cross-sectional, online survey of Australian community pharmacists was conducted between June-October 2013, with pharmacists recruited from state-wide pharmacy professional associations, pharmacy faculties, and continuing education events.

RESULTS

145 pharmacists completed the survey. Over 90% of respondents considered that community pharmacists have a responsibility to provide treatment to HIV patients, and that RHT should be offered in the pharmacy setting. Over half (51%) felt comfortable advising a patient of a preliminary positive HIV result. Comfort in giving such a result was not associated with gender, age or level of experience ($P > 0.05$). However, a number of barriers to conducting RHT were identified including: lack of education for pharmacists (85%), lack of support from health insurance and the Australian Government (76%), and lack of knowledge as to where to refer HIV-infected patients for medical follow up (72%). Saliva was preferred over blood for the testing fluid (62% versus 10%) and 74% believed that the Pharmacist should conduct RHT rather than the Pharmacy Technician (4%) or both (22%).

DISCUSSION

Pharmacists have the potential to play a significant role in increasing RHT and the majority of respondents expressed a willingness to become involved. However, significant training and financial barriers were identified. The possibility of piloting such an approach should be considered, to further evaluate the optimum ways in which this can be achieved.

Medication related burden and patient lived experience with medicine - understanding patient's daily life and practical implications: A systematic review

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The burden of living with medicine impact patients' wellbeing and quality of life either as immediate experiences of short term effects of medication use or long term medication related patient outcomes. This study aimed to review literatures for measurements of medication related burden and patients' lived experience with medicines to identify and describe multifaceted dimensions of lived experience with medicines independent of particular drug therapy or medical conditions.

METHODS

A systematic search was conducted of English language articles published from January 2000 to September, 2014 in Medline, Embase, International Pharmaceutical Abstracts, Psycinfo, Global health, Cinhal and Web of science databases to identify relevant original articles linking medication burden and patients lived experience with medicine. Databases searched were augmented with a manual search of references from selected articles and citation tracking for retrieved articles was also undertaken. The explicitness and comprehensiveness of reporting in each primary study was examined using a published checklist developed for assessing the reporting of qualitative studies. All the titles and abstracts of retrieved studies were screened by one reviewer and confirmed by two members of the research team and articles that met eligibility criteria were included in the study.

RESULTS

To date, 35 articles have been included in the study. Major themes and subthemes were reviewed for each study and identified themes were examined to identify similarities and differences. Three major inter-related and comprehensive themes were emerged central to patients' lived experience with medicine: Inherent medication burden, patients' psychosocial factors and, medication taking behaviour.

DISCUSSION

Patients taking medicine for any medical conditions encounter variety of medication related burden ranging from minor and manageable to life threatening burden, which affects their day-to-day life including wellbeing and quality of life. For practitioners, considering patients' lived experience with medicine may have substantial importance to identify and resolve patient centered medication therapy problems and provide drug therapy education to improve medication taking practice. Resolving or minimizing patients' medication burden will be helpful to improve patient medication therapy outcome, wellbeing and ultimately medication related quality of life. This abstract highlights the ongoing systematic review work which is in progress to date.

Amber teething necklaces – medical marvel or maternal myth?

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BACKGROUND

Baltic amber-bead necklaces or bracelets are commonly used for managing teething symptoms in infants. The effectiveness of these beads is claimed to be from succinic acid release (a compound with analgesic and anti-inflammatory properties), which is then absorbed through the skin.

AIM

To investigate whether Baltic amber teething necklaces purchased in Australia contained succinic acid, and to quantify succinic acid release from the beads.

METHODS

Infrared spectroscopy was used to confirm that the teething necklaces were made of Baltic amber. The amount of succinic acid contained within the beads was quantified, and succinic acid release from intact beads was measured in phosphate buffered saline (PBS) pH 5.5 or octanol to simulate aqueous or oily skin environments.

RESULTS

Each necklace (33 beads in length) contained 19.17 ± 4.89 mg of succinic acid (mean \pm se). Over a 6-month period, no succinic acid was detected in PBS, while 0.13 ± 0.09 mg of succinic acid per necklace was released in octanol. Only one replicate of amber beads in octanol released succinic acid, and they had fragmented, with shards free-floating in the solvent.

DISCUSSION

It is likely succinic acid was only detected because the beads were breaking down in octanol, which does not occur when worn around the neck of a child. Furthermore, the hydrophilic properties of succinic acid would not favour its absorption across hydrophobic layers of the skin and into the bloodstream.

CONCLUSION

While the teething necklaces do contain small quantities of succinic acid, it is highly unlikely to be released from intact beads.

An algorithm of medication review in residential aged care facilities: focus on minimizing use of high risk medications

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METHODS

We aimed to develop a pragmatic, easily applied algorithm for medication review. The literature was searched for evidence of association of adverse effects related to potentially inappropriate medications (PIMs) in older patients. High risk medications were identified as those having robust evidence of cause and effect. Prior research into the cessation of PIMs in older patients in different settings were synthesised into a 4-step algorithm for incorporation into clinical assessment protocols for patients in RACFs.

RESULTS

The algorithm comprises several steps leading to individualised prescribing recommendations: 1) identify a high risk medication; 2) ascertain the current indications for the medication and assess their validity; 3) assess if the drug is providing ongoing symptomatic benefit; 4) consider withdrawing, altering, or continuing medications according to the findings in steps 2 and 3. Decision support resources were developed to complement the algorithm in ensuring a systematic and patient-centred approach to medication discontinuation. These include a comprehensive list of high-risk medications and their propensity to cause geriatric syndromes, lists of alternative treatments, and suggested medication withdrawal regimens.

DISCUSSION

The algorithm captures a range of different clinical scenarios in relation to PIMs and offers an evidence-based approach to identifying and, if appropriate, discontinuing such medications. Studies are required to evaluate prescriber perspectives on enablers and barriers to use of the algorithm in everyday practice, and determining algorithm effects on prescribing decisions and patient outcomes.

Prevalence of swallowing difficulties and medication modification in customers of community pharmacists

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BACKGROUND

People may alter their solid oral medication dosage forms to make it easier to swallow. However, modification of solid medication dosage forms can lead to undesirable effects, and people may alter the dosage forms without informing the health professionals involved in their care.

AIM

To estimate the prevalence of swallowing difficulties and medication modification amongst community pharmacy consumers, and to investigate consumer views, attitudes, and interactions with health professionals regarding such issues.

METHODS

Consumers were recruited from five community pharmacies in Brisbane, Queensland and invited to participate in a structured interview.

RESULTS

A total of 369 consumers participated in the study. Overall, 16.5% of people reported experiencing swallowing difficulties, and 10.6% of all respondents reported modifying medication dosage forms. Almost half (44.2%) of those surveyed did not think there would be issues with modifying medication dosage forms. Some consumers would not seek advice from health professionals if they experienced swallowing problems and/or would not seek advice from health professionals before modifying their medication dosage forms, regardless of their thoughts about any problems associated with this practice.

CONCLUSION

Some consumers appeared to be accustomed to modifying medication dosage forms, even when there was no apparent or obvious need. People were also reluctant to seek advice from health professionals regarding swallowing difficulties, or modifying medication dosage forms. Health professionals must be assertive in educating consumers about swallowing problems, and medication dosage form modification.

Online health information vs consumers' navigational needs

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INTRODUCTION

While health information is readily available on the Internet, its quality cannot be assured. Consumers are also faced with navigating voluminous information and determining its relevance. Little research has been conducted to assist consumers with finding reliable and relevant information.

METHODS

Following a comprehensive literature review and qualitative research involving health consumers, a national online survey was conducted to quantify and describe navigational needs of health consumers with chronic conditions. The questionnaire requested demographic data, and assessed health information-seeking behaviours (HISB), patient activation and eHealth Literacy. A sample of 400 consumers was statistically determined. The survey was pilot tested using 40 additional consumers. Participants were recruited by a survey research company, instructed by our inclusion criteria.

RESULTS

The intended sample size was achieved. No significant changes resulted from the pilot survey. Of the 400 participants, 39% were male, 41% had completed a tertiary qualification, and the most common age range was 25-34 years (30%). Key measures of HISB revealed the most common information sought were 'medical conditions' (89%), and 'medicines/medical devices' (69%). The median patient activation score was 58.3, suggesting participants were likely to be at the early stages of engagement with their healthcare. eHealth Literacy scores demonstrated moderate correlation with patient activation.

DISCUSSION

Further analyses will explore relationships between the three concepts of HISB, patient activation and eHealth Literacy, and also other predictors of navigational needs. This study will inform initiatives for publishers of online content. Better-informed consumers are likely to engage more effectively with their health management.

Are pharmacists prepared to work in private general practice clinics in Malaysia?

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METHODS

This study explored pharmacists' views on integrating pharmacists into private general practitioner (GP) clinics in Malaysia. Pharmacists were invited to participate in focus groups and semi-structured interviews in Klang Valley, Malaysia. Participants were recruited via a combination of purposive, snowball and convenience sampling. Sessions were audio recorded and transcribed verbatim. Data were thematically analysed using NVivo 10.

RESULTS

A total of 19 pharmacists participated in two focus groups and four semi-structured interviews between September and October 2013. Four major themes were identified: (1) Limited potential to expand pharmacists' roles, (2) Concerns about non-pharmacists dispensing medicines in private GP clinics, (3) Lack of trust from consumers and private GPs, (4) Cost implications.

DISCUSSION

Participants felt that there was a limited role for pharmacists in private GP clinics. This was because the medicines supply role is currently undertaken in private GP clinics without the need of pharmacists. The lack of trust from consumers and private GPs towards pharmacists is mainly due to the belief that healthcare is the GPs' responsibility. This suggests that there is a need for public and GP awareness of pharmacists' roles. Most participants were concerned about an increase in cost to private GP visits if pharmacists were to be integrated. Nevertheless, some participants perceived the integration as a means to reduce medical costs through quality use of medicines. In conclusion, the perceptions of pharmacists on their preparedness to work within private GP clinics need to be considered prior to the integration of pharmacists into private GP clinics.

Inappropriate formulation choices in the administration of medication to elderly patients with dysphagia in nursing homes

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BACKGROUND

Inappropriate food or medication texture in patients with dysphagia is the most significant risk factor for pneumonia.⁽¹⁾ Dysphagia is prevalent within care homes for the older person as it is largely found in conditions associated with ageing.⁽²⁾ Patients with swallowing difficulties are more likely to suffer from medicines administration errors.⁽³⁾ This study was designed to determine the appropriateness of medication formulation choices in elderly patients with dysphagia in care homes.

METHODS

A specialised pharmacist trained in the administration of medication to patients with dysphagia observed nurses in care homes during drug rounds administering medication to older patients. Prescribing was considered inappropriate when solid medication was prescribed for administration to patients diagnosed with dysphagia.

RESULTS

739 administrations of medication were observed across 166 patients with and without swallowing difficulties in 6 nursing homes. 38 (22.9%) patients with dysphagia accounted for 143 (19.4%) of the administrations. In 35 cases, prescribing was deemed to be inappropriate due to sub-optimal formulation selection by the prescriber. When the appropriate formulation was chosen, 1.9% of the cases presented signs of aspiration vs. the 77.2% of cases that presented aspiration when the formulation choice was inappropriate ($P < 0.001$, Fisher's Exact).

DISCUSSION

Care home patients with known aspiration were frequently found to be prescribed sub-optimal formulations and this could increase the likelihood of respiratory disease and hospitalisation. In many instances liquid medicines or thickened formulations would be more suitable choices. Further research is needed to determine whether a lack of awareness of dysphagia, unidentified availability of other formulations or other factors can affect prescribing choices.

Evaluation of a patient cam-with-chemotherapy educational brochure

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INTRODUCTION

The majority of cancer patients take complementary and alternative medicine (CAM) during chemotherapy treatment. As biologically active CAM may detrimentally interfere with chemotherapy treatment, cancer patients require targeted, evidence-based information on chemotherapy-CAM integration consequences. The object of this study was to investigate the prescriber recommendation potential and patient acceptance of a purpose designed patient educational brochure on the safe use of CAM with chemotherapy.

METHODS

Chemotherapy prescribers at the Sunshine Coast Cancer Care Services day unit; oncologists, haematologists, training registrars and rotational registrars, were provided a draft version of a patient educational brochure developed by the authors and completed a structured feedback form. Cancer patients receiving treatment in the Sunshine Coast Cancer Care Services day unit were provided the brochure and completed the local health service consumer testing feedback form.

RESULTS

All chemotherapy prescribers (17/17) perceived a need for the brochure and would recommend the brochure to their patients. 59% of prescribers (10/17) indicated they would recommend the brochure to all patients receiving chemotherapy and 41% (7/17) preferred that only patients using CAM or who enquired about CAM be given the brochure. Cancer patients receiving chemotherapy (12/12) reported the brochure information was relevant, answered their CAM questions and was easy to understand.

DISCUSSION

This evidence-based CAM-chemotherapy patient brochure may be a useful adjunct for use by cancer care health professionals to educate patients on the potential dangers of biologically active CAM use with chemotherapy and to provide patients safe CAM alternatives.

An exploratory pilot study assessing the role of community pharmacists as oral health advisors

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INTRODUCTION

Pharmacists play a key role in providing primary healthcare advice to the general population. This study explores the role of community pharmacists as oral health providers within Brisbane metropolitan city.

OBJECTIVE

To assess the frequency and nature of oral health advice sought by community pharmacy customers, determine where community pharmacists acquire oral healthcare knowledge and assess community pharmacist's attitudes and perceived need for further education in oral healthcare provision.

METHODS

Thirty community pharmacies were identified within the inner suburbs of Brisbane city and were visited in person requesting pharmacist participation in a validated oral health questionnaire. Data were collated to explore the role of community pharmacist's as oral healthcare providers.

RESULTS

Twenty-two community pharmacists (73.3% response rate) participated in the pilot study. More than 50% of the respondents received 5 or more oral health presentation per week relating to toothache, mouth ulcers, advice on smoking cessation and for analgesic medications to relieve oral-related pain. Most pharmacists reported they were confident identifying oral health related conditions and giving advice on oral health products; the majority of pharmacists obtained knowledge during their undergraduate studies or during CPD and respondents believed further education was beneficial to their practice as a pharmacist.

DISCUSSION

From this exploratory pilot study, pharmacists have an important role in the provision of oral healthcare in communities. Albeit high pharmacist confidence ratings in handling oral health issues, a majority of respondents desire further education to enhance practice.

Stability of Warfarin tablets repackaged in dose administration aids

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BACKGROUND

Dose administration aids (DAA's), which include compartmentalised plastic boxes, blister packs and sachet systems, are widely used to improve patient adherence, to reduce patient/carer stress associated with complicated medication regimens and to better disease control. Despite the widespread use of DAA's, these are not suitable for all patients or for all medicines (1, 2).

OBJECTIVE

To determine the physical and chemical stability of warfarin full tablets and half-tablets (halved using a pill cutter) stored in DAA's at controlled room temperature (25°C/60%RH), accelerated (40°C/75%RH) and simulated 'in-use' conditions over a period of 8 weeks.

METHODS

UV visible spectrophotometry (T60, PG Instruments Ltd, U.K.) was used to determine the amount of warfarin in the tablets at predetermined time points. Texture analyser (TA-XT Plus, Stable Micro Systems, London) was used to determine the tablet hardness at each time point.

RESULTS

UV-visible spectroscopy showed a considerable reduction in the amount of warfarin in both full tablets and half-tablets at 4 weeks of storage (all conditions). A significant ($p < 0.05$) reduction in content was observed at 8 weeks when half-tablets were stored in blister packs and Dosett[®] boxes at accelerated conditions. Texture analysis also showed a substantial reduction in hardness of half-tablets and full tablets stored at accelerated conditions for 8 weeks.

DISCUSSION

The results indicate that stability of warfarin is affected by storage conditions as well as splitting of tablets. Halving of tablets is likely to have increased the moisture absorption by tablets leading to reduced tablet hardness and degradation of warfarin.

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How can we optimise medicine dollars in the high cost/low volume setting?

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INTRODUCTION

Hospitals are required to maintain stock of high cost/low volume medicines to be available on an 'as needed' basis. These items often expire prior to use and are therefore required to be 'written-off', a cost to the pharmacy, hospital and healthcare system as a whole. They can also, at times, require importation which can cause delays in supply. These factors combined create a complex inventory management environment.

METHODS

A literature review and environmental scan was undertaken to describe current evidence on, and impact of, health resource management on high cost/low volume medicines.

RESULTS

Multiple methods of inventory management for medicines are applied within a facility. Examples include economic order quantity model, ABC control method, Multiechelon inventory systems and 'just-in-time' inventory management. Major considerations of inventory models include (1) cost of ordering, (2) holding costs, and (3) shortage costs.

DISCUSSION

The results have demonstrated that an opportunity exists to improve management of high cost/low volume medicines. This could be facilitated, for example by a national register for high cost medicines allowing sites to minimise or eliminate losses from these medicines by using a more formalised and streamlined process. In addition to being a cost saving initiative, this register could provide a mechanism for fast access to rare medicines that might otherwise cause delays to patients' treatment.

What is the acceptable level of compliance with treat to target strategy when treating early rheumatoid arthritis to remission or low disease activity?

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BACKGROUND

Treating to remission or low disease activity (LDA) using a treat-to-target (T2T) strategy is considered the best practice approach to managing rheumatoid arthritis (RA). However, non-compliance with the T2T protocol is common in daily practice.

OBJECTIVE

To determine the cut-points for compliance with T2T strategy that optimally discriminate remission from non-remission and LDA from non-LDA.

METHOD

In this analysis of longitudinal observational data from patients with early RA, compliance to a T2T protocol was determined for each clinic visit over 3 years. Outcomes were remission and LDA according to disease activity score in 28 joints (DAS28), simplified disease activity index (SDAI) and clinical disease activity index (CDAI). Optimal cut-points were determined using receiver operating characteristic curves.

RESULT

Overall, 149 patients completed 3,078 clinic visits over 3 years of follow-up. Treatment decisions complied with the T2T protocol in 2,343 of these visits (76.1%). The optimal cut-points for compliance rates that predicted remission ranged from 81.1% (DAS28) to 92.7% (SDAI). Cut-points for LDA were lower at 70.7% for DAS28 and 77.4% for both CDAI and SDAI. Based on the cut-points for remission and LDA, three categories of compliance with T2T were proposed: *high* (>80% for DAS28 and >90% for SDAI/CDAI), *medium* (70-79% for DAS28 and 75-89% for SDAI/CDAI) and *low* (<70% for DAS28 and SDAI/CDAI <75%).

CONCLUSION

Using real-life data, we determined the thresholds for compliance with T2T protocol that stratified patients according to their disease outcomes and proposed a system for classifying compliance as high, medium and low.

KEY WORDS

Treat-to-target, ROC curve, cut-off value, rheumatoid arthritis, compliance

Montmorillonite clay as a platinum anticancer drug delivery vehicle

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AIM

Evaluate the potential of montmorillonite (MMT) clay to act as an oral, controlled slow release excipient for the platinum anticancer complex PHENSS.

METHODS

The maximum loading was determined by shaking a solution of PHENSS and MMT over 24 hours and the concentration determined by UV-Vis absorbance. Optimal pH loading was also measured. The rate of drug binding was performed using the maximum loading amount of PHENSS in MMT and UV-Vis absorbance measurements taken at 1, 2, 3, 4, 5 and 50 hours. The rate of release was determined at one hour intervals via UV-Vis in phosphate buffered saline and simulated gastric fluid solutions. The mechanism of drug binding was determined by powder X-ray diffraction.

RESULTS

The platinum drug PHENSS surface binds with the clay by ionic bonding. PHENSS binds MMT rapidly (complete within 1 h) with a maximum loading of 0.35 ± 5 mmol of drug per gram of clay. PHENSS is released from the clay via burst release kinetics.

CONCLUSION

Montmorillonite clay displayed typical clay type binding properties but does not display evidence as a slow release delivery vehicle for platinum anticancer drugs.

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