



# 3<sup>rd</sup> PHARM.D. RESEARCH DAY

King Saud University

College of Pharmacy



# What is Pharm.D. Research Day?

Pharm.D. Research Day is an annual forum to highlight research projects of final-year undergraduate Pharm.D. students.

The primary goals of Research Day are to showcase the various types of research in Clinical Pharmacy department, share our mutual interests, and develop intra- and interdepartmental collaborations.

The ideation to organise this Research Day created in year 2014 and it aims to prepare Pharm.D. students for presenting their studies in scientific conferences. Afterwards, this effort has been continued in year 2015, in which all the final-year Pharm.D. students in College of Pharmacy were compulsory to participate in this Research Day to present their studies.

Research Day provides a great opportunity to learn about the clinical research conducted within the School of Pharmacy.

## Message from the Dean ...



لا شك بأن البحث العلمي الرصين هو رافد مهم من روافد مهنة الصيدلة، ولن آتي بجديد إن قلت بأهميته للمؤسسة الأكاديمية. فهو جودة التعليم جناحان تحلق بهما العملية التعليمية. ولقد دأبت كلية الصيدلة بجامعة الملك سعود على الريادة في الإنتاج البحثي كما ونوعاً، وذلك لخصوبة مجال الصيدلة ووفرة معطياته المعرفية، ولتميز منسوبي الكلية القائمين على أبحاثها.

وإيماناً من الكلية بدورها الريادي، فقد رسخت مبادئ البحث في طلابها، وغرست فيهم استشعار أهميته، وأعدتهم بالوسائل والمهارات المناسبة لجعلهم قادرين على إجراء البحوث وفق المنهج العلمي، الذي لم يكن ليتحقق لولا التواصل الجيد بين طلاب الكلية وأساتذتها وإدارتها، فأصبح يوم البحث العلمي بكلية الصيدلة تنويعاً لجهد الطلبة وأساتذتهم خلال عملهم في مشاريع التخرج. وتلك لعمرى من أسعد اللحظات حيث نرى بواذر ما غرسه اساتذة كرام وطلاب مجدون في سعي علمي حثيث، يجمعهم هدف سام ألا وهو بناء وطن قوي، عماده العلم والعمل بعد توفيق الله.

أتقدم بخالص شكري لزملائي أعضاء هيئة التدريس على تولي زمام المبادرة في إرشاد الطلاب نحو طرائق البحث العلمي، وتزويدهم بالمهارات اللازمة ليخطوا خطواتهم الأولى فيه. كما لا يفوتني أن أتقدم بجزيل الشكر لإدارة الجامعة على دعمها المتواصل لكلية الصيدلة، إيماناً منها بمنزلة الكلية كأحدى أهم أذرعة البحث في الجامعة، وأهمية الصيدلة كمهنة تمس صحة المواطن وأمنه.

وفي الختام، أسأل الله عز وجل أن يبارك لنا فيما علمنا، ويعلمنا ما ينفعنا، وأن يديم علينا أمننا وازدهارنا، ويوفقنا لما يحب ويرضى.

د. أوس الشمسان

عميد كلية الصيدلة

## Message from the Vice Dean ...

It is my great pleasure to welcome you to the 3<sup>rd</sup> Pharm.D. Research Day. The Pharm. D. Research Day is a major event held each year at this time for students in Pharm. D discipline to present their scholarly work. In such great event student`s research accomplishments and the important role faculty play as mentors are both highlighted.

Undergraduate student at College of Pharmacy at King Saud University are required to present their research project to a wide audience of interested faculty members and students at the end of their last year before graduation.

To successfully undertake careers in research after graduation, students will need scientific knowledge, practice with experimental design, quantitative abilities, and communication skills and all of these competences will be gained from being enrolled in such research project course.

I congratulate all our students for participating in 3<sup>rd</sup> Pharm. D. Research Day and I wish them all the best in presenting and defending their projects. In addition, I would like to extend my appreciation to their supervisors from both campuses and those participating in organizing the Research Day at College of Pharmacy.

**Best Regards,**

**Nouf Alrasheed, PhD.**

**Vice Dean, College of Pharmacy**

## Organizing Committee

### Girls Section

**Dr. Maha Mishal AlRasheed, PhD**

*Assistant Professor of Pharmacogenetics  
Clinical Pharmacy Department (chairperson)  
Advisor of the Vice Rector for Projects for Safety and  
Security Affairs*

### Boys Section

**Dr. Tariq Mohammed Alhawassi , PhD**

*Assistant Professor of Clinical Pharmacy  
Director of Medication Safety Research Chair*

**Dr. Mohammed Nasir AlArifi , PhD**

*Professor of Clinical Pharmacy  
Clinical Pharmacy Department,  
Director of Drug and Poison Information Centre*

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*Assistant Professor  
Clinical Pharmacy Department  
Vice Dean of Deputy Student's Affairs (Female)*

**Dr. Maha Mishal AlRasheed, PhD**

*Assistant Professor of Pharmacogenomics  
Clinical Pharmacy Department*

**Dr. Tariq Mohammed Alhawassi , PhD**

*Assistant Professor of Clinical Pharmacy  
Director of Medication Safety Research Chair*

## Speaker and Moderators

**Dr. Muneera Alwhaibi**

*Assistant Professor  
Clinical Pharmacy Department,  
College of Pharmacy, KSU*

**Dr. Lamya Alnaim**

*Assistant Professor  
Clinical Pharmacy Department,  
College of Pharmacy, KSU*

**Dr. Fadilah Aleanizy**

*Assistant Professor  
Pharmaceutics Department,  
College of Pharmacy, KSU*

**Dr. Monirah Al-babtain**

*Clinical Pharmacy specialist, Adult  
cardiology  
Deputy Director, Research Department  
Prince Sultan Cardiac Center*

**Dr. Hadeel AlKofide**

*Assistant Professor  
Clinical Pharmacy Department,  
College of Pharmacy, KSU*

**Dr. Noha Al-Aloola**

*Assistant Professor  
Clinical Pharmacy Department,  
College of Pharmacy, KSU*

**Dr. Jawza Alseban**

*Lecturer  
Clinical Pharmacy Department,  
College of Pharmacy, KSU*

# Editorial Team

## Principle Editors

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**Nouf Almeshal**, MSc (RD website and organizing committee member)

**Fawaz Almutairi**, BScPharm (RD website)

**Nawal AlHarbi** , BSc (logistic team)

# Event Website

<http://pharmacy.ksu.edu.sa/cpird/en/>

{قُلْ هَلْ يَسْتَوِي الَّذِينَ يَعْلَمُونَ وَالَّذِينَ لَا يَعْلَمُونَ ۚ إِنَّمَا يَتَذَكَّرُ أُولُو الْأَلْبَابِ (9)}

سورة الزمر - آية رقم 9

# SCIENTIFIC PROGRAM

APRIL 19, 2017

(BOYS SECTION)





# BOYS

Time	Topic	Speaker and Group
10:00 - 10:10	Welcome Address	Dr. Aws Alshamsan, PhD Dean, College of Pharmacy

Time	Topic	Presenters
Session Chair		
Professor Mohammed AlArifi		

10:10 - 10:30	The Economic Burden of Obesity & Associated Disease in Saudi Arabia (Pilot Study)	Assim F. Aldohish
10:30 - 10:50	Impact of a Multidisciplinary Education Program for Diabetic Patients with Persistent Self-Management Difficulties	Sultan Almutairi , Rayan Alzahrani , Mohammed Alhusayni
10:50 - 11:10	Encouraging Factors to Promote Adverse Drug Reactions Reporting among Pharmacists	Ahmed Aldryhim, Abdulrahman Alomair, Meshari Alqhtani
11:10 - 11:30	The Prevalence of Multi-Drug Resistant Urinary Tract Infection In Saudi Arabia	Abdulrahman Alnuaim, Abdullah Alshehri
11:30 - 12:00	Awards and Closing Remarks	Dr. Aws Alshamsan, PhD Dean, College of Pharmacy
12:00-1:00	Prayer and Lunch	Dr. Tariq Alhawassi , PhD

# The Economic Burden of Obesity & Associated Disease in Saudi Arabia (Pilot Study)

**Student(s) Names:** Assim F. Aldohish.

**Supervisor(s) Names:** Dr. Mohammed Alsultan, Dr. Saleh Alrajhi and Dr. Fowad Khurshid.

## ABSTRACT:

### Background

Obesity represent a growing threat to population health, in an increasing number of countries. In Saudi Arabia, prevalence of obesity in men over 20 years were 30% and female over 20 years were 44.4%.

### Methods

This was a prospective observational cost of illness study conducted in the Endocrine and Obesity & Metabolism Centre (EOMC) of King Fahd Medical City in Riyadh between June and December, 2016. All patients who had BMI over 30 and age over 20 yrs. were included. Clinical data were extracted from the patient's computerized database, and combined with the unit cost of services to calculate costs.

### Results

44 patients were visited the clinic during the study period. 36 patients were included in the analysis. Most of the patients were females (n=21, 56.7%). Approximately 22.72% of study population having co-morbidities. Co-morbidities followed were diabetes, hyperthyroidism. Total cost of all medical care was SAR 252682.1 during the study. Average cost of care /patient/month was SAR584.91. If the result were extrapolated to the whole year, it is estimated that obesity and associated diseases will cost to EOMC a SAR7018.95 per patient/year. Average cost/year (ACY) associated with normal weight SAR941.14, Obese I SAR5948.55, Obese II SAR 6383.67 and Obese III SAR7391.49. Furthermore, ACY for Obese & diabetic type 1 patient SAR37534.78 and Obese & diabetic type 2 was SAR5867.122.

### Conclusions

The obesity and associated diseases can lead to economic burden in the country. The resource consumption associated to obese & diabetic type 1 was the highest in terms of costs.

# Impact of a Multidisciplinary Education Program for Diabetic Patients with Persistent Self-Management Difficulties

**Student(s) Names:** Sultan Almutairi , Rayan Alzahrani , Mohammed Alhusayni

**Supervisor(s) Names:** Dr. Mohamed N. Al-Arifi, Dr. Salmeen D. Babelghaith.

## ABSTRACT:

### Objectives

To evaluate the impact of a multidisciplinary education Program (MEP) on patient outcomes in type 2 diabetes patients.

### Methods

A retrospective study was used to evaluate the impact of multidisciplinary education Program (MEP) on patient outcomes. This study carried out at diabetes education clinic in King Khalid University Hospital. Where patients were referred from diabetes outpatients clinics to diabetes education clinic to receive an intensive multidisciplinary education Program (MEP). Clinical outcomes of type 2 diabetes patients included glycemic control, blood pressure, weight, and lipid profiles were assessed before MEP and at 3,6 and 12 months.

### Results

A total of 142 patients with type 2 diabetes patient who fulfilled the inclusion criteria and were thus included in the study. The mean age of participants was  $53 \pm 13$ . The result indicated that diabetic patient's improved their glycemic control where, A1C, and blood sugar levels were significant reduced after 3, 6 and 12 months of MEP compared to baseline ( $p < 0.05$ ). Moreover the blood pressure was improved after education but no significant found in the mean systolic blood pressure (SBP) from baseline to 12 months, only found significant in and diastolic blood pressure after 12 months ( $p = 0.016$ ). In addition, this study found some improvement in the lipid profiles, and weight after education but, however the improvement was not significant ( $p > 0.05$ ).

### Conclusion

The multidisciplinary education Program (MEP) in diabetes and its management plays an important role in the improvement of patient clinical outcomes.

# Encouraging Factors to Promote Adverse Drug Reactions Reporting Among Pharmacists

**Student(s) Names:** Ahmed Aldryhim, Abdulrahman Alomair, Meshari Alqhtani.

**Supervisor(s) Names:** Dr. Tariq M Alhawassi, Dr. Bander Albalkhi and Dr. Mansour A. Mahmoud

## ABSTRACT:

### Background

Adverse drug reactions (ADRs) are a worldwide problem of a major concern and associated with under-reporting.

### Objectives

To identify potential factors that may encourage pharmacists in community and hospital settings to report ADRs.

### Methods

This was a cross-sectional survey using an online self-administered validated questionnaire designed for this study. Community pharmacists working in chain pharmacies and five hospital pharmacies (two academic hospital, three tertiary referral hospitals) in Riyadh region were invited to participate.

### Results

A total of 1717 community pharmacists (response rate 85%) and 153 hospital pharmacists (response rate 40%) had participated in the study. Only 11.3% of community pharmacists and 29.5% of hospital pharmacists have ever reported an ADR. Both community (69.2%) and hospital pharmacists (70.6%) agreed that improvement in therapeutic knowledge about ADRs continuously would encourage reporting ADRs. Moreover, seriousness of ADRs would be encouraging to be reported by community (73.3%) and hospital pharmacists (68.3%). Majority of community pharmacists showed that offering continuous medical education hours, and attending educational events about ADRs would encourage reporting ADRs. On the other hand, around sixty percent of hospital pharmacists believed that appropriate access to patient medical profile and availability of simple and easily accessible ADRs reporting system would encourage ADRs reporting in hospitals.

### Conclusions

It is essential to identify causes behind ADRs under reporting and to design a new system to increase the ADRs reporting taking into consideration factors that may encourage more ADRs reporting.

# The Prevalence of Multi-Drug Resistant Urinary Tract Infection in Saudi Arabia

**Student(s) Names:** Abdulrahman Alnuaim, Abdullah Alshehri

**Supervisor(s) Names:** Dr. Wael Mansy, Dr. Bander albalkhi and Dr. Sultan Alghadeer

## ABSTRACT:

### Background

Urinary Tract Infection UTI is one of the most common infections worldwide. Despite the causes, risk factors and complications being known and studied extensively, UTIs remain a challenge to the healthcare system because of the emergence of antimicrobial resistance.

### Aim

The aim of this study is to report the most common Urinary Tract Infections' causative organisms associated with the emergence of antimicrobial resistance in Saudi Arabia.

### Methods

A cross sectional retrospective study of 1919 positive urine culture samples of both genders collected over 9 months (May 2015 to February 2016) from a major tertiary hospital in Riyadh, Saudi Arabia.

### Results

Of the total samples enrolled, the median age was 43 years with males constitutes 27.7% only. Among complicated cases (81.1%) Diabetics, pregnant and immunocompromised composed 24.7%, 11.9% and 10.8% respectively. *Escherichia coli* (52%) was the most common Uropathogen, followed by *Klebsiella pneumoniae* (15.3%), *Pseudomonas aeruginosa* (7.8%) *Streptococcus agalactiae* Group B, (7.2%), and *Enterococcus Fecalis* (5%). Overall sensitivity studies showed the highly resistant Uropathogen was *Escherichia coli* (60.4%) followed by *Klebsiella pneumoniae* (15.5%), *Pseudomonas aeruginosa* (3.3%) *Enterococcus Fecalis* (3.1%), and *Enterobacter cloacae* (2.3%). Being the commonest uropathogen in the study, *E.coli* showed highest resistance to Amox/Clav (65%), then 47% to Sulfamethoxazole/Trimethoprim, while *Klebsiella pneumoniae* showed highest resistance to Sulfamethoxazole/Trimethoprim (35%) followed by Tetracyclin (30%) and finally *Pseudomonas aeruginosa* showed highest resistance to levofloxacin (11%) followed by gentamicin (7%).

### Conclusions

Due to a high level of antimicrobial resistance amongst the pathogens causing UTI in Saudi Arabia, the development of regional and national UTI guidelines is recommended.



*“IMAGINATION is the Highest Form of Research “*

*— Albert Einstein*

# SCIENTIFIC PROGRAM

APRIL 20, 2017

(GIRLS SECTION)



# GIRLS

Topic		Presenters
<b>8:00-9:00</b>		<b>Registration</b>
<b>9:00-9:20</b>	<b>Health Outcomes Research</b>	<b>Dr. Muneera Alwhaibi, PhD</b> Assistant Professor Clinical Pharmacy Department
<b>9:20</b>	<b>Welcome Address</b>	<b>Dr.Maha M. AlRasheed, PhD</b> RD Committee Chairperson (3 <sup>rd</sup> Pharm.D. Research Day)
<b>9:25-9:30</b>	<b>Opening Remarks</b>	<b>Dr.Inas Alissa, PhD</b> Vice Rector for Female Student Affairs  <b>Dr.Nadia Al-Ghreimil, PhD</b> Dean of Science and Medical Studies  <b>Dr. Nouf AL-Rasheed, PhD</b> Associate Professor, Vice Dean , College of Pharmacy
<b>Session I , Chair</b>		
<b>Dr. Monirah Al-babtain, MS.Pharm,BCPS, FUMHS</b>		<b>Dr. Hadeel AlKofide, PhD.</b>
<b>PSCC</b>		<b>Clinical Pharmacy Department</b>
<b>9:30-9:45</b>	Does Metformin Have Any Antidepressant or Anxiolytic Effects among Women with Polycystic Ovary Syndrome: A Prospective Cohort Study.	Fadiah Al-harbi, Arwa Bellahwal
<b>9:45-10:00</b>	Identification of Novel Missense Mutation in a Saudi Family with Very Long-Chain Acyl -CoA Dehydrogenase Deficiency.	Khawla Asiri, Reem Bamogaddam
<b>10:00-10:15</b>	Evidence Based Supply of Over the Counter Medicines in Community Pharmacies in Saudi Arabia. A Mixed Methods Study.	Nada Alobaid, Areej Alhumsa and Hind Aboheimd
<b>10:15-10:30</b>	The Role of CDKN2B Gene in Cardiovascular Risk in Ethnic Saudi Arabs: A Validation Study	Nourhan Elsherif, MentAllah Hefnawy
<b>10:30-10:45</b>		<b>Coffee Break</b>



## Session II , Chair

**Dr. Lamy Alnaim, Pharm.D.**

***Clinical Pharmacy Department***

**Dr. Fadilah Aleanizy, PhD**

***Pharmaceutics Department***

<b>10:45-11:00</b>	Practice patterns for oral chemotherapy at different cancer centers in Riyadh, Saudi Arabia, Multicenter, Observational study.	Abeer Althiban, Manal Alrohaimi
<b>11:00-11:15</b>	Pharmacy Students and Pharmacists Insights toward Alzheimer's disease patients in Saudi Arabia.	Amal ALanazi, Ahad ALmutairi
<b>11:15-11:30</b>	Two Novel Mutations in Glucosidase Alpha Acid Gene Causing Pompe Disease in three Saudi Families.	Latifah Aldukkan, Lama Alharabi, and Nourah Alshikh
<b>11:30-11:45</b>	Biologics in the Treatment of Moderate to Severe Plaque Psoriasis: A Systematic Review and Meta-Analysis.	Rahaf AlHarthi, Maha AlDoughaim, Wed AlGhannam
<b>11:45-12:00</b>	The Efficacy of Acetaminophen versus Ibuprofen in the Management of Rotator Cuff Tendinitis Pain: A Randomized, Open-Label, Active-Controlled Trial.	Futoon Alqahtani, Samar Alshuwairikh

**12:00-12:15**

***Prayer***

## Session III , Chair

**Dr. Noha Al-Aloola, PhD**

***Clinical Pharmacy Departmen***

**Dr. Jawza Alsabhan**

***Clinical Pharmacy Department***

<b>12:15-12:30</b>	Prevalence, Predictors, and Outcomes of Medication Non-adherence in Subjects with Cardiovascular Disease.	Amal Al Sager & Taif AlBassri
<b>12:30-12:45</b>	Antipsychotics Side Effects and Their Relationship With The Patients Beliefs About Their Medication.	Arwa Basalamah, Maryam Alarfaj
<b>12:45-1:00</b>	Evaluation of statins use: prescribing patterns and associated muscular side effects at a tertiary teaching hospital.	Ashjan Alghanem , Asma Aldossari
<b>1:00-1:15</b>	The Prevalence of Eating Disorders among Female College Students and Their Use of Self-Management Strategies and Help-Seeking Behaviors. A Cross-Sectional Study.	Ghada AlBassam, Sara AlRouwaijeh

<b>1:15-1:30</b>	Student-Led Discharge Counseling Program of High-Risk Medications within a Transition of Care Model.	Afnan Alsunaidi, Sarah Aljahli
<b>1:30- 2:00</b>	<b><i>Lunch</i></b>	
	<b>Awards and Closing Remarks</b>	<b>Dr. Nouf AL-Rasheed, PhD</b> Vice Dean, College of Pharmacy <b>&amp; Dr.Maha M. AlRasheed, PhD</b> Committee Chairperson (3 <sup>rd</sup> Pharm.D. Research Day)

# ABSTRACTS

(GIRLS SECTION)



# **Does Metformin Have Any Antidepressant or Anxiolytic Effects among Women with Polycystic Ovary Syndrome: A Prospective Cohort Study.**

**Student(s) Names:** Fadiah Al-harbi, Arwa Bellahwal.

**Supervisor(s) Names:** Dr. Yazed Al-Ruthia.

## **ABSTRACT:**

### **Background**

Metformin is a commonly prescribed medication in the treatment of Polycystic Ovary Syndrome (PCOS) for ovulation induction. Recently, some evidence suggests that metformin may have antidepressant and/or anxiolytic effects. The aim of this study was to examine the antidepressant/anxiolytic effects of metformin among patients with PCOS.

### **Method**

This was a prospective cohort study in which patients with PCOS, who were  $\geq 18$  years of age, were enrolled. Patients' sociodemographic and medical characteristics were assessed at baseline and three months later for both the metformin and control groups. The antidepressant and anxiolytic effects of metformin were assessed using the Patient Health Questionnaire-9 (PHQ-9) and the Generalized Anxiety Disorder 7-item (GAD-7); respectively. Descriptive statistics were used to examine the difference in the outcomes between the metformin and control groups.

### **Results**

Fifty patients met the inclusion criteria and were enrolled in the study. Out of the 20 patients, who were followed up, 7 were in the control group and 13 were in the treatment group. The mean age and Body Mass Index were  $30.3 \pm 6.36$  years and  $28.62 \pm 4.75$  kg/m<sup>2</sup>; respectively. The difference in the mean scores of GAD-7 before and after treatment among the treatment group was 2.07 (95% CI: 0.021-4.133). However, no significant difference in the mean scores of PHQ-9 before and after treatment among the treatment group was found ( $P \geq 0.05$ ).

### **Conclusion**

The preliminary findings of this study suggest that metformin may have an anxiolytic effect among women with PCOS. The results may change as this study is still ongoing.

# Identification of Novel Missense Mutation in a Saudi Family with Very Long-Chain Acyl -CoA Dehydrogenase Deficiency.

**Student(s) Names:** Khawla Asiri, Reem Bamogaddam.

**Supervisor(s) Names:** Dr. Maha M AlRasheed & Dr. Zuhair Al-Hassnan.

## ABSTRACT:

### Background

Very long-chain acyl-CoA dehydrogenase deficiency (VLCADD) is genetic fatty acid oxidation disease. It occurs due to deficiency or absence of very long-chain acyl-CoA dehydrogenase (VLCAD) enzyme. VLCAD is responsible for mitochondrial  $\beta$ -oxidation of very long-chain fatty acids, a major energy producing pathway in cardiac and skeletal muscle. This study aimed to identify the responsible mutation for VLCADD in Saudi families.

### Methods

Blood samples were obtained from 5 cases in 3 unrelated families, and 200 controls. DNA was extracted using Gentra Puregene DNA purification blood Core kit C. Primers were designed to include coding and exon-intron regions in the ACADVL gene. Polymerase chain reaction (PCR) was performed using Qiagen PCR kit, and the fidelity of amplicons was tested by agarose gel electrophoresis. The amplified DNA was sequenced in the 3730xl DNA analyzer, and the resulting data was analyzed for mutations by Lasergene Software.

### Results

A nonsense mutation (Homozygous c. 134 C>A, p. Ser45\*) and another novel missense mutation (Homozygous c. 1310 A>C, p. Glu437Ala) were identified in ACADVL gene of 3 unrelated Saudi VLCADD patients, two of which were diagnosed in neonatal period and treated. To date, two patients have not shown any VLCADD symptoms because of the early intervention. In contrast, one patient developed poor sucking, grunting in the second day of life, and his laboratory results showed metabolic acidosis and hypoglycemia.

### Conclusions

Our results demonstrate the importance of early detection and treatment of VLCADD. The identification of the causative mutation helps in providing preventive intervention in future pregnancy.

# Evidence Based Supply of Over the Counter Medicines in Community Pharmacies in Saudi Arabia. A Mixed Methods Study.

**Student(s) Names:** Nada Alobaid, Areej Alhumsa and Hind Aboheimd.

**Supervisor(s) Names:** Ghada Aboheimd, Nouf Aloudah and Noura Aboheimd.

## ABSTRACT:

### Background

Despite current studies that showed community pharmacists had a positive attitude toward evidence based medicine (EBM) supply of OTC medicines, there is a lack in EBM practice in community pharmacies. This study aimed to assess and explore EBM in supplying OTC medicines by community pharmacists in Saudi Arabia.

### Methods

The study used a mixed methods approach consisted of two parts. The quantitative study which used a mystery shopper approach for 214 randomly selected pharmacies from Riyadh region using 14 questions-Quest Scholar MAC checklist. Secondly, the qualitative study which encompassed three focus groups with 13 pharmacists from different community practice settings to explore factors affecting EBM practice in supplying OTC medicines from the pharmacist's point of view using theoretical underpinning designed topic guide.

### Results

The analysis showed that only 40% of pharmacists supplied OTC medicines according to EBM. Additionally, logistic regression analysis showed that only two questions asked predicted the correct supply of OTC medicines (describe your symptoms? and when did the symptoms start?). The qualitative part identified a range of 37 factors, some were facilitators such as established patient-pharmacist relationship, some were barriers such as conflicts between available evidence, and some were both such as patient's awareness and education.

### Conclusions

Given the fact that OTC supply is a core function for pharmacists, this study showed a low OTC supply according to EBM. Furthermore, this study identifies several factors explaining this phenomenon. Targeting factors identified in this study might help change this behavior and decrease unwanted events.

# The Role of CDKN2B Gene in Cardiovascular Risk in Ethnic Saudi Arabs: A Validation Study

**Student(s) Names:** Nourhan Elsherif, MentAllah Hefnawy.

**Supervisor(s) Names:** Dr. Maha M. AlRasheed, Dr. Norah Abanmy, Dr. Tariq Alhawassi and Dr. Nduna Dzmiri

## ABSTRACT:

### Background

Genome-wide association studies (GWASs) have yielded a wealth of data supporting the need to identify ethnic variability in their genetic predisposition to disease. However, the actual impact of such findings on an ethnic population needs to be validated through replication studies. In the present study, we elected to verify recent findings of a GWAS performed in ethnic Saudi Arabs demonstrating a strong association with the CDKN2B genomic region with coronary artery disease (CAD) /myocardial infarction (MI).

### Methods

We genotyped eight CDKN2B SNPs for cardiovascular risk in 4,650 (2221 controls, 2429 cases) Saudi Arabs by Taqman assay.

### Results

Four SNPs (rs4977574\_A [1.79 (1.60-1.99);  $p < 0.0001$ ], rs10757274\_A [0.87(0.77-0.97);  $p = 0.014$ ], rs10738607\_A [0.890 (0.795-0.996);  $p = 0.043$ ], and rs1333045\_T [1.84(1.65-2.07);  $p < 0.0001$ ]) were significantly associated with CAD following multivariate adjustments for MI, HTN, and DM; while four others were weakly associated with the disease. Likewise, three SNPs (rs1412829\_G [0.84(0.72-0.97);  $p = 0.019$ ], rs564398\_C [0.81(0.70-0.94);  $p = 0.006$ ], and rs4977756\_G [0.87(0.76-0.99);  $p = 0.036$ ]) were significantly associated with MI after multivariate adjustments for CAD, HTN, and DM; while the other five showed borderline associations. Two SNPs (rs10757274\_A [0.915 (0.840-0.997);  $p = 0.042$ ] and rs1333045\_T [0.918 (0.843-0.999);  $p = 0.048$ ]) were significantly associated with type 2 diabetes and lost their association after multivariate adjustments for CAD, MI, and HTN; while rs10757274\_A showed borderline association with hypertension.

### Conclusions

Our findings strongly support the notion of a critical role of the CDKN2B gene as a cardiovascular risk in ethnic Saudi Arabs. The study also demonstrates the importance of replication studies in ascertaining the role of a genomic sequence in disease.

# Practice patterns for oral chemotherapy at different cancer centers in Riyadh, Saudi Arabia, Multicenter, Observational study.

**Student(s) Names:** Abeer Althiban, Manal Alrohaimi.

**Supervisor(s) Names:** Dr. Lamya Alnaim.

## ABSTRACT:

### Background

Oral chemotherapy carry a high potential of risk on the patients, and might compromise safety and contribute to medication errors. Healthcare professionals play a major role in promoting optimal practices, and reducing challenges related to the use of oral chemotherapy. This study aimed to identify the current practice related to oral chemotherapy prescription, dispensing, monitoring and patient education, and asses' gaps in our practice that needs strategies to improve it.

### Methods

This Multicenter Observational study, took place at 3 different governmental hospitals in Riyadh, Saudi Arabia. A survey adapted by the authors of this study based on literature review, was distributed on pharmacists, physicians and nurses.

### Results

A total of 161 respondents completed the survey, with a response rate of 62%. Among the participants, 81% were specialized in oncology practice, and their average years of experience was 3 to 5 years. Training on the handling of oral chemotherapy was received by 79% of health care providers, and 74% were trained by their organization on patient education. Nurse staff were the most to receive training on oral chemotherapy when compared to other healthcare professionals. Ten percent of the participants stated there were no education for patients on oral chemotherapy is performed. During the past year, there were 17% reports of serious adverse events and 18% reports of near misses in patients receiving oral chemotherapy.

### Conclusions

Results show variation related to oral chemotherapy practice which needs implementation of effective strategies to ensure that patients receive safe and effective management.



# Pharmacy Students and Pharmacists Insights toward Alzheimer's disease patients in Saudi Arabia

**Student(s) Names:** Amal ALanazi, Ahad ALmutairi.

**Supervisor(s) Names:** Dr. Jawza Fahad Alsabhan.

## ABSTRACT:

### Background

Increase pharmacists involvement in the care of patients with Alzheimer disease (AD) will improve clinical outcomes and quality of life for patients and family caregiver. The present study aimed to assess the level of knowledge among undergraduate students and pharmacists.

### Methods

Knowledge of pharmacists and pharmacy students in SA was measured using the 30-item of Alzheimer disease knowledge scale (ADKS). The correlation between the demographic variables and the scores were examined using Pearson's correlation. The simple and multiple linear regression were performed. Ethical approval was obtained from research ethics committee at college of medicine, KSU.

### Results

A total of 192 respondents include 91 pharmacists and 101 students. Overall, the mean score of AD knowledge, as measured by ADKS, was  $19.36 \pm 3.07$  out of 30. Two domains scored with a lower percent of the corrected answers, risk factor (49%) and care given (56%). These domains are medically relevant questions regarding AD, such as factors that linked to AD development and social care to AD patients. For pharmacists, there is statically significant ( $p$ -value  $< 0.05$ ), negative correlation between the scores and their age, also a positive correlation between pharmacist's scores and year of graduation. For students, significant ( $p$ -value  $< 0.05$ ) correlation was with the level of the students which was a positive correlation. One-way ANOVA test was used to assess the knowledge differences between groups ( $p$ -value 0.55).

### Conclusions

Findings of this study can give us snapshots about the baseline of knowledge for our population. Pharmacists and students with high knowledge will improve clinical practice.

# Two Novel Mutations in Glucosidase Alpha Acid Gene Causing Pompe Disease in three Saudi Families.

**Student(s) Names:** Latifah Aldukkan, Lama Alharabi and Nourah Alshikh.

**Supervisor(s) Names:** Dr. Maha AlRasheed & Dr. Zuhair Al-Hassnan

## ABSTRACT:

### Background

Pompe disease is rare multisystem monogenic genetic disorder, inherited in an autosomal recessive pattern characterized by accumulation of glycogen in certain organs leading to impairment in their ability to function normally. The accumulation of glycogen is attributed to defect in the glucosidase alpha acid (GAA) gene which is responsible for degrading glycogen to glucose. Effective control of this disorder is highly dependent on early onset treatment, within 16 days after birth, which will reduce the progress of the disease. We aimed to identify the responsible mutation of Pompe disease in 3 unrelated patients.

### Methods

The study population consists of three unrelated Saudi patients and 330 controls. Patients presented with increased serum creatine kinase and diminished GAA activity in their tissues. Genomic DNA was extracted using Gentra Puregene DNA isolation Kit. GAA gene was portioned into 300-600 bases segments covering the coding regions and intron-exon junctions. Polymerase chain reaction was performed using suitably designed primers. The fidelity of the amplified DNA was checked by gel electrophoresis and sequenced by Sanger sequencing. Sequence data were analyzed for mutations using Lasergene software.

### Results

Novel homozygous mutation c. 1657 C>T p. Gln553\* in the GAA gene was identified, resulting in stop codon. Another novel mutation, c.1431\_1431delT (p.Ile477Metfs\*43), was identified in two unrelated patients changing isoleucine to methionine which was predicted to cause frame shifting and premature protein termination.

### Conclusions

Two novel mutations have been identified in the GAA gene. Detection of these responsible mutations facilitates the early detection and treatment of Pompe disease.

# Biologics in the Treatment of Moderate to Severe Plaque Psoriasis: A Systematic Review and Meta-Analysis.

**Student(s) Names:** Rahaf AlHarthi, Maha AlDoughaim and Wed AlGhannam.

**Supervisor(s) Names:** Dr. Hadeel Alkofide and Dr. Haya AlMalaq.

## ABSTRACT:

### Background

Several new biologics have been recently approved for the treatment of plaque psoriasis. In this study, we aim to compare the efficacy and safety of different biologics versus placebo including newly approved agents.

### Methods

We searched MEDLINE, EMBASE, Web of Science, and the Cochrane Central Register of Controlled Trials for all RCTs that compared effects of biologics versus placebo in patients with moderate to severe plaque psoriasis. The primary outcome was the reduction in psoriasis area severity index by 75% (PASI75), secondary outcomes include side effects and withdrawals.

### Results

Of 9860 studies screened, 37 met the eligibility criteria and were included in the random effect meta-analysis. Biologics showed superiority in achieving PASI75 (odds ratio [OR]: 36.7, 95% confidence interval [CI]: 27.3-49.3),  $I^2 = 75.5\%$ . Subgroup analysis per biologics type revealed: Adalimumab (OR: 27.9, CI: 20.0-38.8), Etanercept (OR: 18.2, CI: 13.9- 23.8), Infliximab (OR: 33.6, CI: 7.0-160.0), Ustekinumab (OR: 43.4, CI: 33.0-57.1), Secukinumab (OR: 37.0, CI: 14.9-92.2), Brodalumab (OR: 78.0, CI: 49.9-122.4), Ixekizumab (OR: 206.5, CI: 127.7-333.8). The results were consistent over multiple sensitivity analyses. Meta-regression showed significant reduction in the effect on PASI75 by each week (OR: -0.07 [ $P = 0.035$ ]). Adverse events, infections, and injection site reactions were significantly higher in biologics; however, there was no differences in serious side effects. Finally, fewer dropouts were reported with biologics.

### Conclusions

Treatment with biologics showed significant superiority over placebo; however, their efficacy seems to reduce over time. Side effects were higher with biologics; though, there was no differences in serious adverse events.

# The Efficacy of Acetaminophen versus Ibuprofen in the Management of Rotator Cuff Tendinitis Pain: A Randomized, Open-Label, Active-Controlled Trial.

**Student(s) Names:** Futoon Alqahtani and Samar Alshuwairikh.

**Supervisor(s) Names:** Dr. Yazed S. Alruthia, Dr. Hisham Alsanawi, Dr. Bandar Albalkhi, Dr. Fairs Alodaiby, Dr. Sultan Alghadeer, Dr. Fakhr Zohair Al-Ayoubi and Dr. Haya Almalaq.

## ABSTRACT:

### Background

Rotator cuff tendinitis is one of the leading causes of a painful shoulder and is currently believed to be caused by inflammation of the tendons. Nonsteroidal Anti-inflammatory Drugs (NSAIDs) are the most commonly prescribed medications to manage shoulder pain. Recently, there was evidence suggesting that NSAIDs may actually delay the healing process and prolong the treatment duration. The aim of this study was to compare the efficacy of ibuprofen versus acetaminophen in the management of rotator cuff tendinitis pain.

### Methods

Patients with mild to moderate pain were randomly assigned to acetaminophen (500 mg PO Q6-8hrs) or ibuprofen (400mg PO Q6-8hrs). Shoulder pain was assessed at baseline and six weeks later using Shoulder Pain and Disability Index (SPADI), and the Quick Disabilities of the Arm, Shoulder, and Hand (Quick-DASH) questionnaire.

### Results

Twenty patients were randomly assigned to Ibuprofen and 9 were assigned to Acetaminophen. The majority of the patients were female (68%), employed (52%), having a high school diploma or higher (90%), and otherwise healthy (86.21%). The difference between the mean scores of SPADI-Disability, SPADI-Pain, and Quick DASH-Disability at baseline and six week after the treatment for the acetaminophen group were 14.16 (95% CI: -15.80- 44.13), 24.22 (95% CI: -2.45-50.89), and 19.44 (95% CI: -2.09-40.98); respectively. And for the ibuprofen group they were 16.37 (95% CI: 6.88- 25.86), 18.42 (95% CI: 4.15-32.68), and 9.54 (95% CI: 0.818-18.27); respectively.

### Conclusions

The preliminary results of this study suggest that ibuprofen is superior to acetaminophen in the management of rotator cuff tendinitis pain.

# Prevalence, Predictors, and Outcomes of Medication Non-adherence in Subjects with Cardiovascular Disease.

**Student(s) Names:** Amal Al Sager & Taif AlBassri.

**Supervisor(s) Names:** Dr. Hadeel Alkofide & Dr. Khalid Alburikan.

## ABSTRACT:

### Background

Despite high rate of cardiovascular diseases (CVDs) in Saudi Arabia, limited data is available on medication adherence in these subjects. The aim of this study is to evaluate medication adherence and its associated characteristics in subjects hospitalized with CVDs, assess the relationship between non-adherence and 30-days outcomes, and re-evaluate medication adherence post-discharge.

### Methods

A prospective observational cohort of subjects  $\geq 18$  years old, hospitalized with CVDs, from two centers in Riyadh. Pre-admission adherence was measured using Morisky scale. Clinical and demographic characteristics and depression status, were collected upon admission. Subjects were followed up for 30-days post discharge for the occurrence of CVD events, and re-assessment of adherence levels.

### Results

140 participants were enrolled, with a mean age of 61.04 years, and 65.70% were men. Pre-admission adherence rate was 29.30% versus 62.90% at 30-days follow-up. Lower BMI was the only predictor for pre-admission adherence (odds ratio= 0.92, 95% Confidence interval= 0.86-0.97). Number of pills prescribed (more than 4 pills per day) and the presence of disabilities were associated with lower adherence levels post-discharge. A total of 48 subjects reported adverse CVD events at follow-up; using univariate and multivariate logistic regression analyses pre-admission adherence did not predict these outcomes.

### Conclusions

Although adherence levels are low in subjects with CVDs, adherence rates increased shortly after hospital discharge. Variables that affected adherence prior to admission seem to differ from those post-discharge adherence predictors. We were unable to find a relationship between adherence and adverse CVD outcomes, possibly attributed to small number of subjects.

# Antipsychotics Side Effects and Their Relationship with the Patients Beliefs about Their Medication.

**Student(s) Names:** Arwa Basalamah and Maryam Alarfaj.

**Supervisor(s) Names:** Dr. Yazed Alruthia, Dr. Hadeel Alkofide, Dr. Fahad Alossaimi.

## ABSTRACT:

### Background

Antipsychotics medications are effective in a wide spectrum of psychiatric disorders. Their side effects (SEs) profile varies among different agents, and can be problematic affecting patients' adherence. The aim of this study was to explore the factors that could potentially influence the self-reported side effects of antipsychotics among patients with mental illness.

### Methods

Adult patients who are on antipsychotics for more than 3 months and agreed to participate in the study were privately interviewed in the outpatient psychiatry clinics at King Saud University Medical City. Antipsychotics SEs were assessed using the Arabic version of Glasgow Antipsychotics Side Effects Scale (GASS). Participants' beliefs about medications were assessed using the Beliefs about Medicines Questionnaire-General (BMQ-General). Information about participants' sociodemographic (e.g., education) and medical characteristics (e.g., comorbidities, other used medications) were also collected.

### Results

Ninety-eight participants were interviewed in which 71.4% of them were females. The majority (78.6%) were on a single antipsychotic, and 88.8% were on atypical antipsychotics. Almost 70% of the participants had moderate to severe SEs with no significant difference between males and females or between those on a single or multiple antipsychotics ( $P \geq 0.05$ ). Although the mean GASS score for participants on typical antipsychotics was higher than their counterparts on atypical antipsychotics, this was not statistically significant ( $P = 0.087$ ). Lastly, the BMQ-Benefit score was inversely associated with the GASS score ( $r = -0.20491$ ;  $P = 0.043$ ).

### Conclusions

More than 50% of study participants reported moderate to severe SEs. It seems that patients' beliefs about medications may affect the reporting of antipsychotics SEs.

## Evaluation of statins use: prescribing patterns and associated muscular side effects at a tertiary teaching hospital.

**Student(s) Names:** Ashjan Alghanem and Asma Aldossari.

**Supervisor(s) Names:** Dr. Abdulaziz alhossan and Dr. Khalid Alburikan.

### ABSTRACT:

#### Background

Statins proved to reduce the risk of atherosclerotic cardiovascular diseases. Although statin therapy should be initiated based on clinical guidelines, usually statin prescribing decision is made subjectively and influenced by population risk level. The objective of this study is to evaluate prescribers' adherence to the ACC/AHA cholesterol guideline upon initiation of statin therapy

#### Method

An observational study conducted from July 2016 to March 2017 at King Saud University Medical City (KSUMC). The prescribing pattern was evaluated based on ACC/AHA 2013 guideline accordingly the patients were classified to one of four statin benefit groups. The recommended statin intensity was determined for each patient and they were assigned to either high or moderate intensity statin. These guideline-recommended statin intensities were then compared to the patient's prescribed statin to determine guideline adherence. Six-month follow-up was conducted for lipid profile along with CK level for patients with recent muscle pain.

#### Results

A total of 107 subjects were included (80.4% newly initiated on statin therapy and 19.6% had a dose increment). Fifty five percent of statin prescriptions did not follow the guidelines. Among the 4 statin benefit groups, non-diabetic patients having ASCVD risk  $\geq 7.5\%$  had the highest percentage of guideline adherence. Fifty percent of the patients had a follow-up lipid panel performed and fewer achieved a therapeutic response. After 6 months follow-up, 14.9% complained of recent muscle pain. Only 3 patients had elevated CK levels.

#### Conclusion

A majority of patients were prescribed on inappropriate statin therapy according to the ACC/AHA cholesterol guideline.

# **The Prevalence of Eating Disorders among Female College Students and Their Use of Self-Management Strategies and Help-Seeking Behaviors. A Cross-Sectional Study.**

**Student(s) Names:** Ghada AlBassam and Sara AlRouwaijeh.

**Supervisor(s) Names:** Dr. Hadeel Alkofide, Dr. Ahmad AlHadi, Dr. Lamy Alnaim, Dr. Refa'h Al-Ajmi and Dr. Nora A. Kalagi.

## **ABSTRACT:**

### **Background**

Eating disorders (EDs) are not well researched in Saudi Arabia. The aim of this study was to estimate both the prevalence of being at risk for developing EDs and the prevalence of having an ED among female college students. In addition, it aimed to assess self-management strategies, and help-seeking behaviours in at risk subjects.

### **Method**

A cross sectional study using a survey tool distributed to female college students, which included the following: the eating attitudes test (EAT-26) and SCOFF (Sick, Control, One, Fat, Food) questionnaire, for screening for EDs; the diagnostic patient health questionnaire (PHQ) to measure EDs prevalence; the help-seeking behaviour questionnaire; and objective oriented questions to assess self-management strategies.

### **Result**

A total of 1353 female college students, living in Riyadh were included. The average BMI was 24.1 (standard deviation [SD] = 5.14), and the majority were from King Saud University. A total of 27.9% participants scored  $\geq 20$  (recommended cut-off for EDs) in EAT-26 (mean = 15.84, SD = 8.66), while 44.6% scored  $\geq 2$  (recommended cut-off for EDs) using SCOFF questionnaire (mean = 1.5, SD= 1.2). In PHQ, total positive scores were 9.01% (Bulimia nervosa: 3.1% and Binge-eating disorder: 5.9%). The mother was the most preferred option when seeking help, while phone helpline was the least preferred. About 10% of participants reported currently using medications or herbal products for weight loss.

### **Conclusions**

The prevalence of EDs among female college students in Saudi Arabia is relatively high and seems to be comparable to data from western countries.



# Student-Led Discharge Counseling Program of High-Risk Medications within a Transition of Care Model.

**Student(s) Names:** Afnan Alsunaidi and Sarah Aljahl.

**Supervisor(s) Names:** Dr. Ghada Bawazeer, Dr. Ibrahim Sales, Dr. Haya M. Almalaq Dr. Mohammad Aljawadi, Dr. Hadeel Alkofide and Dr. Fakher Alayoubi.

## ABSTRACT:

### Background

The risk of 30-day readmission and adverse medication events during transition of care are high. Discharge counselling by pharmacists can reduce emergency department visits and readmissions. Students in advanced pharmacy practice experience can deliver effective medication-related education.

### Method

An open label, randomized control trial on patients (>18 years) discharged on a high-risk medication (warfarin and/or insulin). Using simple computer generated scheme and sequentially-numbered, opaque, sealed envelopes, patients were allocated to either standard of care or the intervention. Intervention arm received: students delivered structured counselling, medication reconciliation and a follow-up call at 72-hr post-discharge. The primary outcome was the rate of unplanned health-care utilization at 30-days.

### Result

At the time of this analysis, 75 patients were randomized; 42 in the intervention arm and 33 in the standard of care arm. Results showed no difference in the primary outcome at 30-days between intervention (19.05%) and standard of care (18.18%),  $p=0.924$ . There was no difference in mean time (in days) to first unplanned healthcare utilization (intervention 19.88(9.19)); (standard of care 13.5(8.73)),  $p=0.214$ . Moreover, there was no difference in time-to-first clinic visit post-discharge ( $p=0.651$ ) between the two arms. Among participants discharged on warfarin, mean time-in-therapeutic range was not different between the two arms ( $p=0.394$ ). Students identified 19 additional DRPs during reconciliation. Patients in the intervention arm reported high satisfaction with the service provided (mean 3.94(0.11)).

### Conclusion

Preliminary data analysis showed that student-led discharge counselling didn't reduce readmission rate at 30-days. However, patient satisfaction is also important for measuring the value of the service.

# Clinical Pharmacy

The Department of Clinical Pharmacy offers courses that aim to grant pharmacy students with practical information which qualifies them to provide better clinical services for patients, thereby contributing to raising the level of health care in general and the proper use of medication, in particular.

The Clinical Pharmacy in a broader terms includes the key role contributions of pharmacists within the health care team. These roles include, the patient interview, follow-up for drug therapy, provides advice and guidance to the patients with respect to the right way to use the medications, and to make sure that there are no drug interactions. In addition, the pharmacist provides advice the doctor, the patient, and the health care and nursing staff with information that will help them provide better patient care.

The College of Pharmacy at King Saud University is considered a pioneer in this area in the Middle East, the college has taken the initiative to develop this area by offerings study plan for two tracks in pharmacy.

### Notes:

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