



جامعة الفيصل
Alfaisal University

Annual Research Day

7th Student Poster
Competition 2016



Acknowledgements

Special thanks to the sponsors who have helped to make this competition a success, to the judges and faculty who have put a lot of effort into helping the students, to the ORG Staff, to PR, IT & Facilities for their dedicated assistance and last but not least, to our outstanding students for taking the time to explore the knowledge that is offered to them and for representing their University in a manner that everyone can be proud of.

We look forward to seeing all of you again in next year's competition.

Primary Sponsor



WINNING POSTERS FROM 7TH ANNUAL RESEARCH & SCIENTIFIC DAY POSTER COMPETITON HELD THURSDAY 7 APRIL 2016 AT ALFAISAL UNIVERSITY

Note: Students submitted over 110 poster applications with 97 posters actually being displayed during the competition. A total of 7 Faculty Judging Groups evaluated the posters with each group being responsible for 10-20 posters. Within each group the top three posters were chosen and given 1st, 2nd or 3rd Prize. Winners will be recognized during the Annual Research awards to be held in Fall 2016

Poster ID		Poster Title	
PRIZE	Medicine & Health Sciences		
Judging Group 4			
1 st	UG-M03-Marashli 2016	Heart rate variability and outcomes prediction in critical illness	
2 nd	UG-M09-Zara 2016	Prevalence of IL28B Gene Variants among the Saudi Population and A Guide to Interferon alpha Treatment in Saudi HCV Patients	
3 rd	UG-M10-AI-Tinawi 2016	Characterization of the functional role of Bromodomain PHD finger transcription factor (BPTF) in heart failure	Innovation project
Judging Group 5			
1 st	UG-M22- Ahmad 2016	Undiagnosed ADHD and Its Negative Effects on University Students	
2 nd	UG-M26-Mina2016	Comparative analysis of parallel PBL and TBL learning modalities	
3 rd	UG-M35-Alkhatib 2016	The Effect of Social Media on Academic Performance – The Alfaisal Medical Student Point of View.	
Judging Group 6			
1 st	UG-M46-Abou Al-Shaar 2016	An endoscopic road map to the internal carotid artery navigating through to the ventral cranial base	
2 nd	UG-M38- Sarkar 2016	Mobile Health Services	Entrepreneurial Proj
3 rd	UG-M54-Sarraj 2016	Enhancing PBL by integrating research competencies in regular PBL sessions: A pilot study.	
Judging Group 7			
1 st	G-M71-AIHaffar2016	Genetic Variants in ACP1 Gene in Risks of Cardiovascular Disorders	
2 nd	UG-M55-Albarqawi2016	The Implementation of a Patient-Assisted Mobile Teledermatology (PAMT) Program in Saudi Arabia: Dermatologists’ Perspective	
3 rd	UG-M70- Albadr2016	Adolescent Perception of Obesity in Riyadh	

Science & Humanities			
Judging Group 2			
1 st	G-S03-Aldawsari 2016	Novel synthesis of holey reduced graphene oxide/polystyrene (HRGO/PS) nanocomposites by microwave irradiation method for cathode in lithium-ion batteries	
1 st	UG-S05-AIMubarak 2016	Screening for Common Blood and Clotting Disorder Mutations in Randomized Samples.	
2 nd	G-S04-Mussa2016	Fabrication of Metal Oxide/ Reduced Graphene Oxide Nanocomposites for Anode in Li-ion Batteries	
2 nd	UG-S01Alrawaf 2016	A comparative study of antibacterial properties of silver nanoparticles/reduced graphene oxide (RGO) and silver nanoparticles/commercial reduced graphene oxide (cRGO) nanocomposites: Role of silver Nanoparticles	
3 rd	UG-S09-AIBathi 2016	Proteomic Analysis and Drug Delivery for Colorectal Cancer; discovery of biomarkers and targeted drug delivery using liposomes nanoparticles	
Engineering & Technology			
Judging Group 3			
1 st	UG-E09- Alkhwashke 2016	Material study of Palm Tree Fibers for New Industrial Applications	
2 nd	UG-E08- AIYemni2016	Solar Car Design and implementation	
3 rd	UG-E21-Sarraj2016	Energy Performance: The neighborhood library	
3 rd	UG-E04- Alarifi 2016	“Arah” ambient assisted living framework	
Business & Management			
Judging Group 1			
1 st	UG-B07-AI Saud2016	Private Sector Engagement with the Saudi Women’s Rights Movement	Innovation Community Proj Service
2 nd	UG-B10-Alshalhoub2016	Coupling System Thinking with Project Management to enable Organization-Wide Change in Family Owned SMEs	
3 rd	UG-B02-Alsheikh2016	The Behavior of Young Novice Drivers in the KSA.	

sk/14/04/2016

Judging Groups for 7th Annual Research & Scientific Day Poster Competition held 9 AM Thursday 7 April 2016 in Ground Floor Library Building

Business & Management
JG1B

- Haitham Al Zoubi (Group Leader)
- Rama Lahyani
- Necati Aidyn
- Robert Zacca
- Giselle Antoine (CoSGS)

Science & Humanities
JG2

- Saddam Muthana (Group Leader)
- George Kulik
- Mohammed Zourob
- Mamoun Bader
- Liliana Braescu
- Christina Decoursey

Engineering & Technology
JG3

- Tarek Mokhtar (Group Leader)
- Abd-Elhamid Taha
- Aliaa Elabd
- Manar AlAlfi
- Samer Mansour
- Fernando Gonzalo
- Francisco Cobo
- Azeem Ahmad

mg/10/04/2016

Medicine & Health Sciences
JG4

- Muhammad Afzal (Group Leader)
- Abrar Barakzai
- Daniella Gherissi

JG5

- Rajaa Fakhoury (Group Leader)
- Shoukat Ali
- Nasir Afsar
- Bibi Kulsoom
- Reem Mubarak
- Paul Ganguly

JG6

- Giuseppe Botta (Group Leader)
- Solomon Senok
- Peter Kvietys
- Stephanos Ioannou
- Jasmine Holail

JG7

- Ahmed Yaqinuddin (Group Leader)
- Santosh Kumar
- Ahlam Al Shedoukhy
- Joe Rey-Ladino
- Rania Nassar

Evaluation Form for Student Poster Competition

Poster Number _____ Name of Judge: _____

CATEGORIES

- A. RESEARCH (Please check () one box):**
- Business & Management Engineering & Technology
 - Medicine & Health Science Science & Humanities
- B. ENTREPRENEURSHIP & INNOVATION : (If applicable please check () one box):**
- Entrepreneurial Ideas & Projects Innovations, Service, Films

Poster Title _____

Please ask presenter to give an overall summary (five minutes) of their work.

Communication, Information Technology Numerical Skills:

- Organization & Delivery** _____/10 points
- Outline: Was there logical flow of thought?
 - Summary: Did it summarize the main points?
 - Tone of voice
 - Visual contact with the audience

- Quality of Poster** _____/10 points
- Level of proficiency in use of information technology (quality & clarity of figures, tables, models)
 - Level of proficiency of numerical skills (computation, if applicable)
 - Is the font size reasonable to read?
 - Is the information too crowded?

Interpersonal Skills, Responsibility Professional Development

- Teamwork, Leadership, Ethics & Lifelong Learning** _____/10 points
- Did the investigator recognize the economic, ethical and environmental implication of such technology?
 - Ability to work effectively with others as a team member and/or collaboratively with others as a team leader to accomplish tasks and achieve team goals
 - Impact on their capacity for personal career progression

Originality & Cognitive Skills:

- Critical Thinking and Problem Solving** _____/10 points
- Is this the students' own work/idea?
 - Ability to reason logically and creatively and apply critical thinking and scientific methods to explore facts, concepts, theories and problems to make informed and responsible decisions and / or to pursue practical solutions for real life problems.
- Ability to Answer Questions** _____/10 points

TOTAL ____ /50 points

Business & Management



UG-E01-Aldosari2016

Innovation – Basic and Engineering Science

The Winter Savior



A Smart CO-Poisoning Proactive Alarming System for Motor Vehicles

Aseel M. Obiedallah, Moznah R. Aldosari, Basmah M. Alghamdi, Amjad K. Alamri

Supervised by: Dr. Samer Mansour, Dr. Nidal Nasser, Dr. Mamoun Bader

Equipment

1. CO sensor.
2. Microcontroller.
3. Wi-Fi access point.
4. Bluetooth device.

System Architecture and Response



If a dangerous level of CO is detected inside a motor vehicle by the sensor, the system will work on preventing or overcoming CO poisoning by reacting as follows:

1. Refresh the air in the car by opening the windows automatically and opening the garage door in case the car was inside the garage.
2. Release Oxygen (O₂) from an O₂ generating device. O₂ may be generated from KClO₄.
3. Reach for help by using a cellphone to contact a specified emergency authority and guide them to the accident via GPS.
4. Turn off the car engine in case the car was idle.

Conclusion and Future Ideas

We hope that our project can decrease the number of deaths caused by CO poisoning. In addition, we wish to improve our project by adding some features in the future, such as:

1. Use weight sensors in the car seats to estimate how many passengers are in the car and use movement sensors to estimate if passengers are unconscious or not. Include this information in the data relayed to the emergency authorities.
2. Integrate with future cars auto-drive and auto-park systems to park the car in case the car was moving.
3. Design a separated version of the project so it can be purchased and installed manually.

Abstract

Carbon monoxide (CO) is a colorless, odorless, tasteless gas, and it is not expected to be perceptible. CO is produced by the incomplete combustion of liquid, solid and gaseous fuels. Further, CO is absorbed through the lungs into the blood in the organs, which leads to serious effects such as dizziness, loss of consciousness, poisoning and death may be resulted with a well-designed alarming system. The goal of this project is to provide a smart proactive alarming system that will take multiple measures as soon as a dangerous level of CO is detected inside a motor vehicle. The system will first react by dialing an emergency number and sending an SMS containing the vehicle's geographic coordinates, and then it will automatically open the vehicle's windows, release oxygen from an oxygen tank inside the vehicle, and in case the vehicle is parked the system will shut off the engine. The plan is to design this system to be integrated with both old and new vehicles technologies. The system is expected to integrate more easily to newer vehicle models that are network enabled and are equipped with intelligent digital systems.

Objectives

Our objectives in this project are:

- To reduce the percentage of deaths from CO poisoning by innovating a smart proactive alarming system that will take multiple measures as soon as a dangerous level of CO is detected inside a motor vehicle.
- To spread the awareness about how dangerous CO is.

Problem Statement

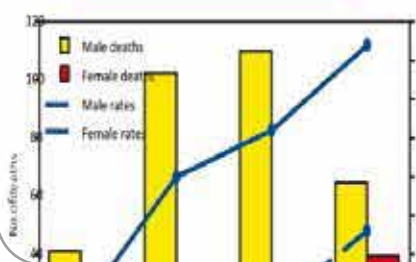
Deaths and poisons are increasing every winter from CO, especially in cars. Thus, the car accidents, poisons, congenital diseases are increasing. CO poisoning is more threatening for people who have heart diseases and asthma, because when they breath, CO molecules will strongly bind to hemoglobin and occupy oxygen place. In addition, it takes less than 20 mins to kill the person while it takes more than one day to leave the body.

Introduction

USA Centers for Disease Control and Prevention (CDC) statistics:

1. Carbon Monoxide (CO) is the leading cause of unintentional poison-related deaths. 45% of those deaths are attributed to motor vehicles.
2. Motor vehicles account for the second major cause of the annual 15,000-50,000 emergency room visits for treatment from unintentional CO poisoning.

Context where a vehicle may cause CO poisoning: faulty exhaust systems, defective engines or poorly tuned engines, leaks in the vehicle's body, warming up a vehicle in a garage even if the door is open. Such cases of unintentional poisoning and death may be avoided with a well-designed alarming system.



In the winter:



After turning the car heater on

References

The Behavior of Young Novice Drivers in the KSA

Aljohara Alsheikh, Fahdah Abdulilah Al Saud, Sarh Sami O. AlRasheed (supervised by Dr Mario Ferrer)

ABSTRACT

Risky driving behaviour has consistently been found, in the literature, to contribute to traffic crashes and negatively impact on smart living. A tool developed specifically to measure the risky behaviour of young novice drivers comprising five subscales was administered to novice drivers aged 17-25 years. Preliminary statistical analysis indicates that crashes were associated with fixed violations, risky driving exposure, and misjudgement; offences were moderately associated with risky driving exposure and transient violations; and road-rule compliance intentions were highly associated with transient violations. The relationships between BYNDS subscales and self-reported risky behaviour and attitudes can also inform countermeasure development, such as targeting young novice driver non-compliance through enforcement and education initiatives.

LITERATURE REVIEW

I. Youth drivers

The road safety literature has documented the overrepresentation of young novice drivers in fatalities and injuries arising from car crashes around the world for decades.

Drivers aged 17-24 years comprised 13.4% of licensed drivers in Riyadh province in 2013 but they contributed 20.0% of the road toll.

In that same year, drivers with a Provisional license represented 5.3% of the licensed driving population but they contributed 8.6% of the province's fatalities, and 25.3% of road users who were fatally injured died as a result of a crash involving a young driver (Traffic Department, 2012).

II. Driving behaviour

The Behaviour of Young Novice Drivers Scale (BYNDS) was developed by Scott-Parker et al. (2010) with the aim of providing a reliable and valid instrument to measure the risky behaviour of young novice drivers specifically.

In their study, 761 tertiary students aged 17-25 years with a Provisional driver's licence were recruited and completed 63 risky driving items derived from the literature relating to young driver crash risk and GDL restrictions as part of a larger online survey.

III. Behavioural issues



VI. METHODOLOGY

Fifty drivers aged 17-25 years (M = 18.23, SD = 1.58, Mode = 17, Median = 18) completed a 15-min self-administered survey. The participants represented the student population at AU.

Participants reported their age and gender and completed the 44-item BYNDS (Scott-Parker et al., 2010) (1 = never, 5 = almost always). Participants also responded to items asking if they had been in a car crash and been detected by Police for committing a driving offence as a driver with a Provisional licence (yes, no).

VII. FINDINGS

The main findings indicate that Young drivers sampled

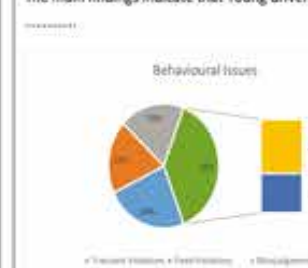


Figure 1

The major reason for fixed violations There are many causes which lead to the accidents. Most of the accidents are done by the drivers' faults. The main fault is transient violation, it is one of the most essential factors that can be done through exceeding speed limit, using alcohol or driving while driver is sleepless so the careless driver loses the control of his driving and accidents occur that may lead to death. In spite of having strict legal punishments about this bad behavior, some drivers still keep utilizing it. There are also some other factors such as misjudgment and risk exposure that can cause real problems in traffic, these drivers give proper attention to the road.



Figure 2

The biggest risk exposure factors The driver may not fasten his seatbelt and keep at the high speed the vehicle. it is hard to stop suddenly so this can result in steering wheel, dashboard or windscreen. In some crashes, the driver may burst through one of the windows and be partially or fully ejected from the vehicle. Not only the driver may injure himself but e also hurt every his car or in other cars. The ratio of the accident caused by unrestrained seat is very high in the recent years. Thus, it is important to fasten the seat belt.

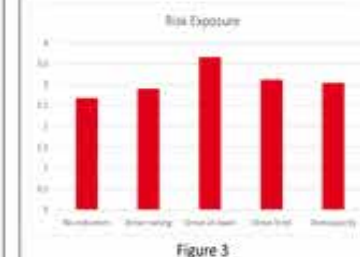


Figure 3

IV. PRACTICAL IMPLICATIONS

The risk exposure is the first step that may lead to accidents As it present loss that may happen as a result of some activities such as driving at dawn, being tired and driving in rainy weather. The risk exposure often ranks risks to their probability of happening multiplied by the potential loss, and it may look at such things as liability issues.

V. Conclusion

Finally, traffic accidents do not happen without any causes. Accidents are done after the mentioned factors, the main causes can be done about drivers. The roads and about some rules may result in accidents. Thus, every drivers have to be learnt fully both about driving and about the traffic rules. The drivers have to be aware about realizing other mistakes. They have also been warned about the legal punishments of their violation of the rules.

3rd Prize Winner

Skills gap awareness and avoidance of Google, Toyota, and Boeing, its effects, and corrective steps that are considered.

ABSTRACT

The following project includes full information about skill gaps that three huge industries, Toyota, Boeing, and Google may be facing and its harsh consequences on them. We would be mentioning how the three industries involved with this procedure of avoiding and emerging alertness of skill gaps and the development they have made in fully comprehending the influence on enactment. The three industries must make frequent corrective steps to prevent this issue or they would suffer deadly results. Data throughout the research is conducted through secondary research and that in order to discover approximately the crucial skill connected variables that has a direct effect on the enactment of the three industries.

LITERATURE REVIEW

➤ Skill gap avoidance
The first step to be taken in order to avoid skill gaps in through establishing an organized recruitment system that can put the right person in the right position. Here are many issues that is very important when recruiting, skills testing is very essential since it can offer a good point of reference, so that the industry can see where the gap is found within the current employees and how can it is resolved in recruiting new ones. Skill testing can test as well current employees' once more after training and progress has been accomplished. This will correspondingly permit the industry to see which workers are able to learn more rapidly.

➤ Skill gap awareness
Spreading awareness about skill gaps is very essential in any industry and that for avoiding it. There are confident aspects that may aid in avoiding the employment of unqualified staff. First there is the past experience they have as well as their level of education. Moreover the lack of essential skills necessary for the place, age, gender, as well as their background. Assessing and considering the training needs the industry as they will accomplish skill testing that can categorize gaps among the requirements and existing skills of the current employees. Hence the company after testing may choose either to employ new staff with certain in need qualifications or train the existing employees on the skills in need.

➤ Impact of Skill Gap
Skill gap has various impact on the industries is comprehensive, precisely in terms of employee willpower as well as his enthusiasm. Furthermore, plentiful of industries are missing unexpected achieving employees to other industries in a restricted market for talents. Hence, skill gaps does have dreadful consequences on the industry as it would lead it to suffer in the future. Skillful staff are considered to be the backbone of the industry that ensures its continuity in the market.

The Conceptual Model of Skill Gaps among various industries



METHODOLOGY

For accomplishing the following research, many methods were used such as previous information about the three companies as well as various means such as article written by many famous writers. All allowed to determine focusses and concepts extended throughout this research project. For the difficulty to reach and have direct contact with the head offices of the three companies we chose using secondary data spread on internet, magazines and books. This all helped us have full awareness of all aspects of the skill gaps and impact of skill gaps on the three industries. The only limitation of the research was the inability to use primary data and establishing questionnaires

FINDINGS

The chief findings designate that industries are aware of such gap and are doing their best to avoid it, they have the full knowledge that with such skill gaps they would be unable to compete in international market as well as lead the market. They are using different steps to avoid skill gap through employing educated and highly experiences people from different countries and backgrounds. Moreover, the three companies in case of Toyota or Boeing or Google, they are investing in their resources and trying to be the first to gain expertise. The other findings was based on the major skill gaps found in the three companies that was based on communication, analytical and service providing gaps.

Why do organizations in different industries are exposed to skill gap regardless their huge reputations?



There are many reasons for having skill gap in various industries such as Google, Toyota and Boeing. The major reason comes in the service design that the three companies meet where they lack the professionalism in their services of management and that dealing with the customers. Hence, the lack of training has increased this gap between the companies and customers as well as services provided. Therefore, by providing high skill work must be in the right position between services and training. Thus, the absence if this customer-defined service provided by the three companies is as well very critical to increase the gap rather than diminishing it.

What some corrective steps the companies are taking to prevent skill gap?

Although the skills gap appears huge, a concentrated strength by all parties will be the toughest possibility to revolving the position around. If the skills gap remains to expand, the concerns could be terrible. Therefore, the first corrective step that the three companies agree on is that skilled employees will be able to replace unskilled workers who retire or move on, as well as the value of college training may increase encouraging new professionals to enter. Hence, that will affect the service provided by the companies to the customers. In addition spending more money on training and development of staff in order to drive companies toward innovation.



What are the major skill gaps the three companies (Google, Toyota and Boeing) are facing?

A skills gap that creep up the sustainability as well as the continuity of industries around the world. And whereas a large part of the skills gap is a deficiency of people skilled in the various fields within the industries (science, technology, education, and math), there has been likewise a huge gap in soft skills such as communication and forward-thinking leadership skills within the three organizations.



Conclusion

Regardless how huge a company is and how much resources it has, the most important issue that may lead it to be more successful is skillful staff. Hence, for a company to progress skill gap should be diminished. The three industries Toyota, Boeing and Google are incorporating additional skills-based and empirical elements into their overall prospectives.

Prepared By: Fahda A. Al Saud

UG-B04-Alsaleh2016 Entrepreneurship

Hira'a Desert Resort and Spa

Adhwa'a Al-Saleh and Nora Al-Helal

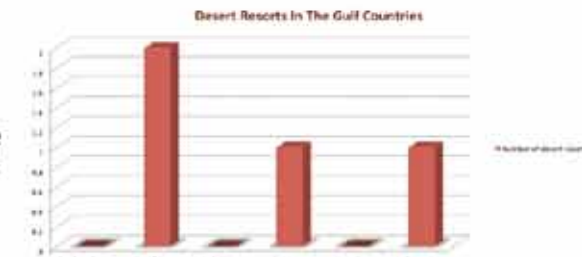
Advisor: Dr. Saad Al-Huqail

Abstract:

The Saudi Arabian Empty Quarter is a beautiful desert that is considered one the 7 wonderers of the world, these golden sands are the heart of our resort. Hira'a enables tourists to experience the real Bedouin life, which is a great attraction for foreigners since they are fond by the Arabian lifestyle. We have studied all aspects regarding our project's business strategy such as; our vision, target market, position, marketing plan and so on. And done several analyses like the PEST and SWOT analysis.

Project objectives:

Re-represent the Arabian culture to the world in its accurate picture and increase Saudi Arabia's tourism by 10% at the end of 2025.



Background:

In Arabic Hira'a refers to the cave that prophet Mohammed peace be upon him used to stay and worship god, feel serenity, peace, and clarity. Our resort is inspired from this perspective. Saudi Arabia's untapped tourism opportunity and the lack of 5 stars resorts emphasizes the true potential of launching a world-renowned tourism industry due to the vast variety of tourist attractions that are not taking advantage of. Above that, the captivating beauty of the Empty Quarter and how it could be the number one destination for tourists around the world.

Materials and methods:

Guided by the maxim that the guest is the center of our attention, Hira'a before anything, promotes hospitality and courtesy towards guests, by giving offering all kinds of services. We aspire towards enlargement and growth along with business responsibilities. We want guest who returns, employee who progresses and capital that grows.

Theory:

Hira'a luxurious desert resort and spa is positioned as the first resort to ever exist in the Empty Quarter. We differentiate our selves by our authenticity, our natural wealth, golden sands, original foods, and traditional activities.

Excepted results:

Hira'a, will improve the tourism industry greatly due to our consistence in promotion of excellence, novelties, and future development. We will be the leading resort in the industry. We expect to get 1M SR sales per year and reach an awareness rate of 70% of our target market during the first 2 years.

Conclusions:

Hira'a's competitive advantage is its location and natural wealth. Our authenticity is the key to our success. We will provide our tourists with a lifetime Bedouin experience. Stay tuned!

Private Sector Engagement with the Saudi Women's Rights Movement

Jawaher Bint Ahmed AlSaud, Iman Alrebdi, Lena Altamimi and Maha Abahusseini
Faculty Advisors: Maurice Murphy & Giselle Antoine

Introduction

- Significant research on social movements influencing public policy
- Scholarship has recognized the significant role of social movements as a force for societal change. Studies have explored the extent to which these movements have altered firm behavior
- Tactics utilized by social movements to target business organizations include: protests, rallies, sit-ins, strikes, and boycotts
- Research mirrored in Arab and Islamic World, particularly in the aftermath of the Arab Spring
- Minimal scholarly attention to Saudi Arabia in the context of the Arab Spring or on advances in the women's rights movement that occurred during this period

Literature Review

- **"Public politics"** - a corporate political strategy when social movements lobby the government to change industry practices
- **"Private politics"** - focuses on strategies used by movement actors to threaten companies who do not concede to their interests
- **Our contribution:** No study has explored the co-opting of major entities within the private sector by a social movement to lobby the state in advancing the movement's goals. We will refer to this form of mutually supportive politics as **"representative politics"**

Research Questions

- Who are the major actors in the Saudi women's rights movement and who are their private sector allies?
- What are the factors that have enabled the success of the Saudi women's rights movement?
- How did the movement co-opt important elements of the private sector?
- What tactics have the women's movement activists and their private sector allies jointly employed to influence public policy regarding women's issues?

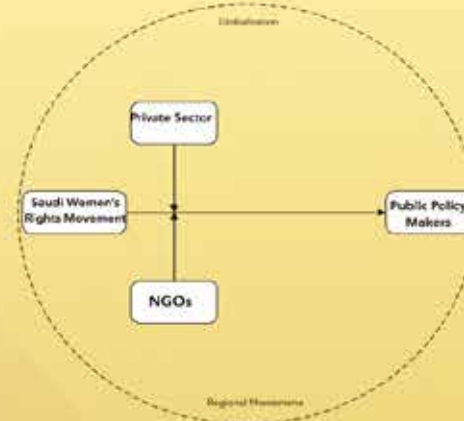
Methods

Qualitative approach to explore the history, strategies and tactics of the movement
This approach is most suitable for studies exploring social phenomena (p. 20, 21)

Phase 1: We used LexisNexis to scrutinize global media reports (i.e. newspaper articles & petitions, Wang and Soule, 2012) and various social media search engines (Twitter, Facebook, YouTube) in English and Arabic to identify movement leaders, strategies and tactics

Phase 2: Based on our analyses of media sources, we formulated questions for the interview phase of this study, which we have yet to conduct

Findings



- The movement has evolved over time
- The movement has used various tactics with varying degrees of success
- Social media has enhanced exposure of the successes
- Actors include men and women of different social statuses


MOVEMENT SUCCESS FACTORS:

- ✓ **Gradual** - a gradual approach allows segments of society to evolve and slowly embrace transitions, rather than imposing radical changes
- ✓ **Timing** - initiating changes when the target issue is not on the public conscious is more effective
- ✓ **Quiet** - most successful changes did not make any media appearance until after the changes were already legalized
- ✓ **Consensus** - consensus building is more effective and culturally appropriate than confrontation

Conclusion

- Identified approximately 27 potential interviewees, including: prominent business leaders, Jeddah Chamber of Commerce and Shura Council Members
- Discerned that the movement has developed and involved complex issues the movement has successfully affected
- Ascertained tactics that have met varying degrees of success
- We will conduct semi-structured interviews to extrapolate the tactics used to co-opt business and how the movement has "learned" over time



The background is a dark blue field filled with digital motifs. On the left, a large light blue triangle points towards the center. In the top right, a peach-colored triangle points towards the center. In the bottom right, a dark blue triangle points towards the center. A large green triangle points towards the bottom left. The background is overlaid with glowing blue lines, a circular grid pattern, and horizontal bands of binary code (0s and 1s).

Engineering & Technology

UG-E01-Aldosari2016

Innovation – Basic and Engineering Science

The Winter Savior



A Smart CO-Poisoning Proactive Alarming System for Motor Vehicles

Aseel M. Obiedallah, Moznah R. Aldosari, Basmah M. Alghamdi, Amjad K. Alamri

Supervised by: Dr. Samer Mansour, Dr. Nidal Nasser, Dr. Mamoun Bader

Equipment

1. CO sensor.
2. Microcontroller.
3. Wi-Fi access point.
4. Bluetooth device.

System Architecture and Response



Abstract

Carbon monoxide (CO) is a colorless, odorless, tasteless gas, and it is not expected to be perceptible. CO is produced by the incomplete combustion of liquid, solid and gaseous fuels. Further, CO is absorbed through the lungs into the blood as the oxygen, which leads to serious effects such as death. Such cases of unintentional poisoning and death may be avoided with a well-designed alarming system. The goal of this project is to provide a smart proactive alarming system that will take multiple measures to warn as a dangerous level of CO is detected inside a motor vehicle. The system will first react by sending an emergency number and sending an SMS containing the vehicle's geographic coordinates, and then it will automatically open the vehicle's windows, release oxygen from an oxygen tank inside the vehicle, and in case the vehicle is parked the system will shut off the engine. The plan is to design this system to be integrated with both old and new vehicles technologies. The system is expected to integrate more easily to newer vehicle models that are network-enabled and are equipped with intelligent digital systems.

Objectives

Our objectives in this project are:

- To reduce the percentage of deaths from CO poisoning by innovating a smart proactive alarming system that will take multiple measures as soon as a dangerous level of CO is detected inside a motor vehicle.
- To spread the awareness about how dangerous CO is.

Problem Statement

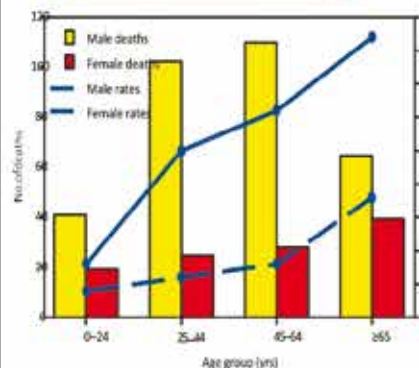
Deaths and poisons are increasing every winter from CO, especially in cars. Thus, the car accidents, poisons, congenital diseases are increasing. CO poisoning is more threatening for people who have heart diseases and asthma, because when they breathe, CO molecules will strongly bind to hemoglobin and occupy oxygen place. In addition, it takes less than 20 mins to kill the person while it takes more than one day to leave the body.

Introduction

EPA covers for Emission Control and Prevention (ECP) regulatory:

1. Carbon Monoxide (CO) is the leading cause of unintentional poison-related deaths at 55% of those deaths are attributed to motor vehicle poisonings.
2. Motor vehicles account for the second major cause of the annual 15,000-20,000 emergency room visits for treatment from unintentional CO poisoning.

Cases where a vehicle may cause CO poisoning: faulty exhaust system, defective exhaust or poorly tuned engines, holes in the vehicle's body, warming up a vehicle in a garage even if the door is open. Such cases of unintentional poisoning and death may be avoided with a well-designed alarming system.



The statistic above shows the increment of the number of deaths due to CO poisoning.

In the winter:



After turning the car heater on



Conclusion and Future Ideas

We hope that our project can decrease the number of deaths caused by CO poisoning. In addition, we wish to improve our project by adding some features in the future, such as:

1. Use weight sensors in the car seats to estimate how many passengers are in the car and use movement sensors to estimate if passengers are unconscious or not. Include this information in the data relayed to the emergency authorities.
2. Integrate with future cars auto-drive and auto-park systems to park the car in case the car was moving.
3. Design a separated version of the project so it can be purchased and installed manually.

References

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RESEARCH

Poster code: UG-E02-Shaikh 2016

Conception of smart and green buildings based on solar energy and photovoltaic materials

Supervisor: Dr. Souraya Goumri-Said/ Mr. Mounath Abdulftah

Team members: Sameen Shaikh, Arshia Akhtar, Moznah Aldosari, Juweria Ali Imran



How we can solve the problem

Close observation of the occupants, along with soliciting the opinions of users, better building designers should understand their role as service providers. This is where the smart building lacks in, being flexible to the updating world, while consciously anticipating user preferences and meeting conditions of users need. All this, and still being environmentally green. A possible solution could be using the BMS network system and hence each possessing their own set of identifying cookies to help the system configure the best solution for all occupants at any given time. As suggested indicated by research cognitive function scores were better in green building conditions compared to the conventional building conditions across nine functional domains, including crisis response, strategy, and focused activity level. On average, cognitive scores were:

1) percent higher in green building conditions

2) percent higher in enhanced green building conditions

These preliminary findings suggests that green buildings positively affect public health. Savings in health and productivity costs because of increased earnings, reduction in respiratory diseases, and higher employee retention made up 85% of total whole-life cost savings, with the savings in energy, water and waste making up the remaining 15%.



Conclusion and Future Ideas

More research needs to be done in order to understand users' reaction to smartness. Moreover, working on evolving and greener structural framework, as it holds half the embodied energy of the building. Preliminary analyses identified several limitations to the study design, as well as potential solutions that could inform future studies. Larger studies, with more sites and participants, would allow for evaluation of the independent and interactive effects of IEQ attributes on employees' perceived health and well-being and productivity outcomes and for the use of triangulation methods to increase the credibility and validity of perceived employee outcomes. As smart building technology is intended to serve human needs, software engineers and architects could gain valuable insights by communicating with behavioral psychologists hand in hand, in designing of the BMS system. Furthermore, post-occupation evaluation (POE) along with living demonstration of a building could be vital to ensure the building meets the needs of its occupants while being green. Green buildings will result in both health and will add economic benefits in the future of the society by not only improving air quality and reduced chemical exposure taking particular care to ensure that materials are reused, and recycled and we can avoid up to 95% of the traditional construction waste on several projects.

References

- Green smart building are adaptive to continuously advancing technologies while being constantly responsive to the upgrading lifestyle of its inhabitant. Well-designed green buildings will be increasingly economical, comfortable and create healthier atmosphere to live and work, using improved indoor air quality, natural daylight, and thermal comfort. While minimizing adverse impacts on the environment (air, water, land, natural resources) through optimized building siting, optimized building design, material selection, and aggressive use of energy conservation measures.

Abstract

We propose to design smart and green buildings for the future. We target to collect all the possible criteria to build future green houses with desired target functions and rich properties which will enable us to focus on research of clean materials for solar energy. An alternative solution mainly based on our resources of renewable energy was suggested a long time ago. Renewable technologies based on solar photovoltaics (PV) and solar thermal are the most efficient that produced a large amount of heat and are used for the thermal desalination of water. We will detail, how buildings might be accommodated to their users and incorporate our needs into new design methods with high control over the environment. The creation of healthier buildings to live and work will be realized throughout the improvement of indoor air quality and using natural daylight, and thermal comfort. Computational modeling of solar cells and PV devices based on physics laws and using HPC computers have allowed scientist to progress in their research of new and smart materials. In the present research poster we propose the feasibility of creation of smart buildings from different points of view: architecture, physics, computing and medical.



Introduction

Green smart building are adaptive to continuously advancing technologies while being constantly responsive to the upgrading lifestyle of its inhabitant. Well-designed green buildings will be increasingly economical, comfortable and create healthier atmosphere to live and work, using improved indoor air quality, natural daylight, and thermal comfort. While minimizing adverse impacts on the environment (air, water, land, natural resources) through optimized building siting, optimized building design, material selection, and aggressive use of energy conservation measures.

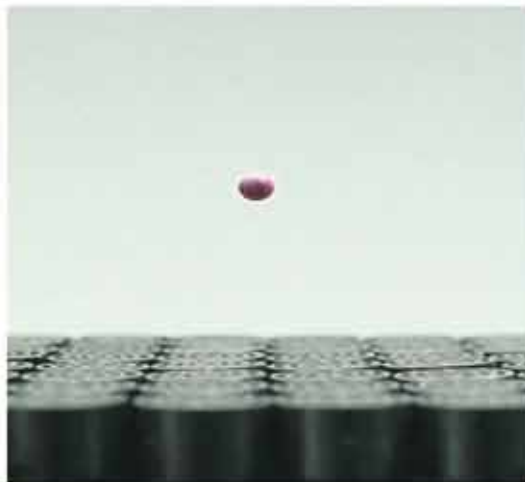
Describing the problem

In today's run race life, people may lack knowledge, or simply time for the creation of optimally efficient environmental conditions. Moreover, while retrofitting smart technologies to already existing building could be challenging for some groups to adapt to. In addition to this currently a building's lifespan is about 50 to 100 years, whereas there could be dramatic developments and advancements in digital technologies within a short period cycle of 2 to 5 years. We spend about 90 percent of our time indoors, and buildings have a unique ability to positively or negatively influence our health. Chemicals that define indoor air quality can also affect health. Further, having a great effect both on our personal and professional, for example in perceived alertness and work hours affected by asthma, respiratory allergies, stress and depression and is off-reported productivity.



UG-E03-Alghareeb 2016: Entrepreneurship

MOVING OBJECTS USING SOUND WAVE



Problem

Nowadays things like

- Pollution is an international problem
- Noise is one of the factors to increase pollution
- Space where we can't use some machines in tight places.

Become a huge case that we need to consider it in our daily life.

Solution

To use sound waves at a high frequency that human can't hear, and apply it to the object. this will be faster than huge machines, this device can easily be used in tight places, green to the environment so less pollution, and less expensive than heavy machines.

OBJECTIVES

- Weight handling
- Move the object it in 2D
- Easily operated
- Move the object it in 3D

Methodology

- The parameters of wave
- Different equations developed for the force needed from the wave
- The specifications of the speaker
- Materials that get affected by sound parameters
- The change of voltage and its affect on the results

Made by Simple Items To Make It Easily Operated



PROJECT OUTCOMES

- The outgoing sound creates a light of air coming out of the speaker
- Developed a way to convert square wave to an approximate sine wave
- Designed an enclosure
- Created a code to measure the value and give the needed frequency

Fatimah Al-ghareeb

Category: Innovation
Poster Code: UG-E04-Alarifi 2016

"ARAH" REMOTE PATIENT MONITORING

SENSOR-BASED VITAL SIGNS GATHERING, REASONING AND NOTIFICATION SYSTEM

Abeer Z. Alissa Alanoud A. Albaiz Fatemah N. Alshaikh
Sara M. Alarifi Shaden M. Alhedaihy

Supervised by: Dr. Manar Alarifi Dr. Abdulkarim Almakadma

1 MOTIVATION

Problem scenario 1:

As a mother, I constantly worry that my child might get an asthma attack in school, or when I am not around.

Problem scenario 2:

As an only son, I cannot skip classes from the university to stay with my mother after her surgery.

2 PURPOSE

"I wish I can check in on my loved ones from afar"

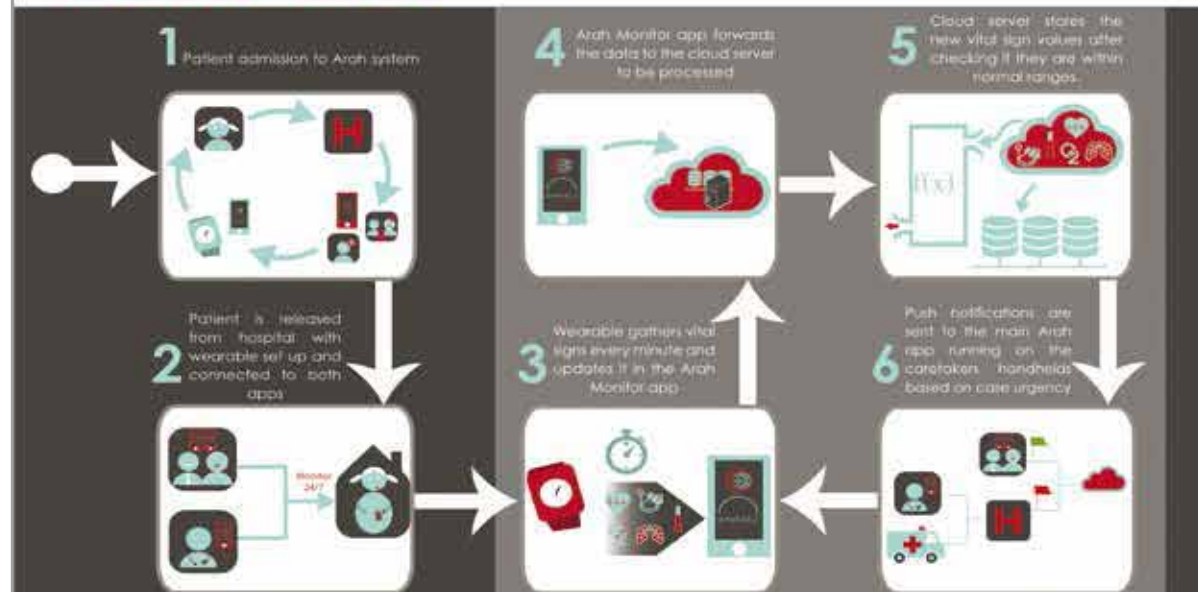
3 EXPERIENCE

Interact with an affordable, reliable, easy-to-use, interface to monitor loved ones from afar.

4 INTRODUCTION

Introducing Arah, the complete monitoring framework that employs sensing technology to gather patient's vital signs and communicate them wirelessly to a cloud service in order to reassure parents and caretakers through a mobile app interface about the health status of their loved ones.

6 USAGE LIFECYCLE



7 CURRENT RESULTS

Arah:

- Completion of the applications' initial local database implementation.
- Completion of the applications' hospital admin interface.

Arah Monitor:

- Simulating the wearable through an Android wear emulator.
- Connected wearable to the Arah Monitor app on an android.
- Forward the data to a dedicated server via TCP.

Server:

- Temporary server script to receive vital signs and store them in a database via TCP.
- Bluemix cloud server to receive vital signs via HTTP. [Under development]

8 PLANNED WORK

Arah:

- Implementation of doctors, patients, and relatives web and application interfaces.
- Integration of all user ends databases.

Arah Monitor:

- Migrate the wearable from a simulator to an e-health sensor.

Server:

- Employ Bluemix cloud technology to develop a database-enabled solution with an HTTP API and push notification capabilities.

9 ACKNOWLEDGMENTS

The authors would also like to thank Alfaisal University for funding and supporting our project and Dr. Muhammad Anan and Dr. Samer Mansour for the help and information they provided.

3rd Prize Winner

UG-E05-Tazim2016

Research in Engineering & Technology

Acknowledgement: Dr Samer Mansour

Non-Traditional Education Methods in Industrial Engineering

Mohammad Tazim, Abdulrahman AlTabba, Abdulrahman Shalash, Khaled Alsadoon, Mohamed Tarek, Mohammed Alkhuzayyim, Syed Adnan, Arwa Alanqary, Deena Gashgarey, Hoda Elsayed, Nourah Alrubaig, Lulua Alsudairi

START

Introduction

- To ensure that programs offer assistance in realizing the country's strategic goals, while conforming to current international academic standards.
- To ensure that Bachelor degree programs in industrial engineering can provide students with sufficient theoretical knowledge and skills applicable in real work environments, in a non-industrial environment as the university can often be a challenge, given the limited budget and access constraints.
- More specifically, use of educational games to simulate real life decision making processes, and allow students to experience virtual scenarios to train their senses and improve their logical problem-solving skills is emphasized.

Methodology

The Gaming Creator



The Unreal Engine is a game engine developed by Epic Games, first showcased in the 1998 first-person shooter game Unreal. Although primarily developed for first-person shooters, it has been successfully used in a variety of other genres, including stealth, MMORPGs, and other RPGs. With its code written in C++, the Unreal Engine features a high degree of portability and is a tool used by many game developers today.
Horvath, Stu (May 17, 2012).

The Gaming Designer

- Cinema 4d
- SolidWorks
- GrabCad
- Blender
- 3D max
- Rhino 3D



The Gaming Programmer



Results



Requirements will be collected from industrial students through future survey to validate the currently existing prototype. And the main target of this study will be female industrial engineers around RSA

Reference

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- H. Joo, M. Gama, The impact of a simulation game on operations management education, *Computers & Education*, 57 (2011) 1240-1254
- M.A. Lewis, M.R. Maylor, Game playing and operations management education, *International Journal of Production Economics*, 105 (2007) 134-149
- A. Ranchhod, C. Gurun, E. Loukil, R. Trivedi, Evaluating the educational effectiveness of simulation games: a value generation model, *Information Sciences*, 264 (2014) 75-90

UG-E06-JAWADI 2016: INNOVATION

MRP OF A BISCUIT PLANT



LOCATION

SS
REORDER POINT
MISTAKE PROOFING

PRODUCT 1
PRODUCT 2
PRODUCT 3

PRODUCT 4
PRODUCT 5
PRODUCT 6



OBJECTIVE

IMPROVE
EFFICIENCY OF
RAW MATERIAL
DISTRIBUTION
IN THE MIXING
AREA



MATERIAL
REQUIREMENT
PLANNING

CURRENT



OBJECTIVE

SYNCHRONIZE RAW
MATERIAL
PURCHASING WITH
PRODUCTION
PLANNING TO
MINIMIZE INPUT &
OUTPUT DEVIATION

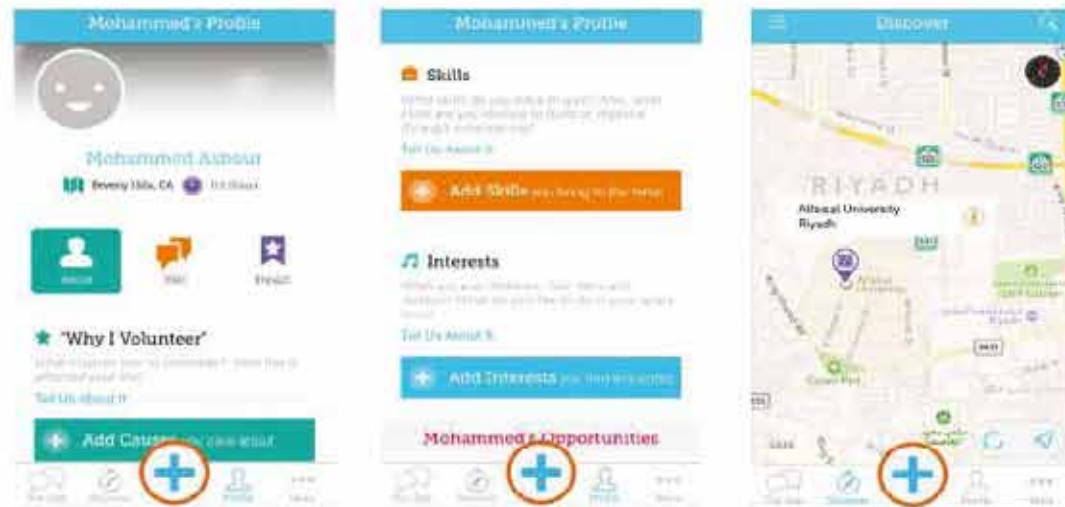


PROPOSED

LINA JAWADI
REEM H ALSAUD

Code: UG-E07-Ashour 2016
Innovation: Community Projects

Title: Saudi Volunteering Platform
The volunteering mobile App Project "عطاء"
Name: Mohammed A. Ashour



Introduction

Volunteering is a great noble act, where individuals or groups perform any type of effort with no financial gain. In the last years, the Saudi youth showed a great sense of responsibility and enthusiasm to give back to the society and a huge expansion in the number of people and committees have been noticed. Along with all this effort, the volunteering structure is in need of more advanced organizing. Not only on within committees but on a larger scale. And from that prospective a national platform must exist.

Current Issues:

- No accurate date for volunteers.
- Weak acknowledgement of volunteers' rights.
- Unprofessional organization and misuse of individual efforts.
- Opportunities aren't well announced.

Project objectives:

- Provide users with tools to better enrich their volunteering experiences.
- Provide committees with experts' guidance and support to start their initiatives.
- Help users better understand their rights and duties as volunteers.
- Establish a safe and healthy communicating environment between individuals and event organizers.
- Establishing a unique, one of its kind, database of volunteers.
- Proper monitoring of non-profit efforts to ensure more beneficial experience for users.

Methodology:

The project is to make a mobile application that serves the non-profit work through:

- Establish accounts for all volunteers, including experiences, skills, certification with limitation very personal information.
- Volunteering committees will have pages announcing future events with a background of what have been accomplished previously.
- Users will be informed of any upcoming volunteering opportunities depending on their preferences, academic majors and geographic location.
- Sponsors and organization can join to ease the campaigns/events launching.
- Users can sign up to join through the application, and organizers will be able to view applicants' pages with no exposure to personal information. Making the process professional.

Who can join?

- Individuals.
- Volunteering Committees.
- Universities Clubs.
- Non-profit organizations.
- Sponsors.

Statistics:

- 70% of students extracurricular work is non-profit.
- No unified national database exists, few regional and limited to sponsors.
- 65% of volunteers are under legal age.
- Only 60 certified non-profit foundation/organization.

Category: Research Poster Code: UG-E08-Alyemni2016

BOEING SOLAR CAR PROJECT

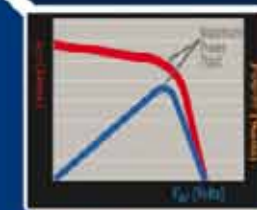
Abdulaziz Alyemni Abdulaziz Alnukta Khaled Alsaleh Mohammed Alghanim
Syed Adnan Khaled Sulaiman Fahad Albeshier

Supervised by: Dr. Ahmed Otafy Co-supervised by: Dr. Hassan Zohair

Abstract: Solar powered Electric Vehicles (EVs) pose a new and exciting field of innovation. Their use of clean and renewable energy contributes to their public acceptance and demand. This Boeing funded project entails the design, prototyping, and implementation of a solar car. The mechanical team are focusing on providing the most aerodynamic design while optimizing the load to weight ratio. As for the electrical team, they aspire to increase the efficiency by tracking the maximum PV power point and designing a system that provides a path for regenerative braking.

Maximum PV Power Supply:

This module aims to charge the car's battery bank with maximum efficiency. The charging method is called Maximum Power Point Tracking (MPPT) where an algorithm is developed to continuously track the optimal operating point of the PV panel along its IV curve. The algorithm controls a buck converter that can match the optimal voltages of the PV and the battery pack independently.



American Solar Car Challenge:

Location:
Pittsburgh,
PA, USA.

Date:
22/07/2016

Solar Car Motor Control:

The motor controlling circuitry is the beating heart of the electrical module. It delivers three phase trapezoidal currents to the BLDC Motor. Moreover, it provides power to the battery through regenerative braking. The purpose of this circuitry is to control the current delivered to the three phases of the motor to operate it properly, meanwhile ensuring that it doesn't exceed the ratings of the motor. An algorithm is implemented through a microcontroller that reads the variables of the circuit through sensors, then compares them to the reference signals provided from the driver's interface. Thus, sends the appropriate signals.

Mechanical Module:

The main aspects of the mechanical module are the body, chassis, suspension, transmission and braking. The chassis, or the frame of the vehicle, is the skeleton that supports all the components along with the body and bears all the loads. It should be well designed and engineered in order to withstand these loads and give a stiff structural integrity. We are designing an aluminium alloy spaceframe chassis that uses triangulation technique to bear axial loads from all directions. Carbon fibre body panels will be installed on the chassis. The overall body shape has to be as aerodynamic as possible to minimize drag and maximize top speed. The chassis will also house the suspension system which is a double wishbone type for the two front tires and swing arm type for the single rear one. The power will be transmitted from the motor to a gearbox which in turn will move the rear wheel. As for the stopping power we plan to use a dual disc hydraulic braking system that is front-rear split.



2nd Prize Winner

UG-E09- Alkhwashke 2016

Material Study of Palm Tree Fibers for New Industrial Applications

Alkhalaf T, Kalakattawi F, Cruz F, Alkhawashki S, Alrubaiq N

Introduction

In many industries, such as the automotive, a lot of various parts are manufactured using fiberglass or carbon fiber, besides using other types of materials. Many limitations are associated with these materials in terms of cost, availability, quality and manufacturing process. There is minimum variation in strong lightweight and efficient materials, especially those that can be used for the fabrication of a vehicle's outer shells. Strong, lightweight composite materials available in the market can be very costly as well as relatively difficult to manufacture. On the other hand, naturally occurring fibers in the environment are not widely used in composite materials. In this research, we aim to use palm tree fibers (PTF) to study its wide spectrum applications such as the fabrication of vehicle's outer shells.

Objectives

- Using a local natural fiber (PTF) for the manufacturing of a strong, lightweight composite material.
- Testing the palm tree fiber (PTF) composite material for mechanical properties.
- Comparing PTF composite materials with carbon fiber and fiberglass.
- Studying the applications of PTF in various industrial sectors proposing new applications for PTF.

Data Investigation

Palm Tree Fibers

Characteristics & Advantages

Light weight, High performance, Availability, Low cost
Replace other materials in construction, automotive and aerospace industries

Statistics

7 MILLION TONS
Number of produced dates in Saudi per year

100,000 TONS
of Date Palm Fibers (DPF) are produced in KSA alone

15,000 TONS
of Date Palm leaves (DPL) are produced in KSA alone

Properties

Good thermal properties
Acoustical insulation properties

DPF was the best regarding specific Young's modulus to cost ratio criterion
Medium long fiber laminates (30 mm) exhibit 3 to 4 times the strength of wood

Methodology

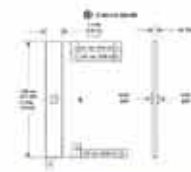
Fiber Treatment



Mold Manufacturing

Specimen Dimensions

Specimen	Length (mm)	Width (mm)	Thickness (mm)
Compression	100	10	2
Tension	100	10	2
Bending	100	10	2
Impact	100	10	2



Specimen Dimensions for Compression Test



Aluminum Mold done by CNC Machine

Sample Fabrication



DPF Composite Testing



Applications



UG-E10- Alrubaiq 2016

Studying the Mechanical Properties of Leukemia blood Cells Using Nano-indentation & Finite Modelling

Alkhalaf T, Aldeghaishem N, Adnan S, Zafar M, Muhsen I, Alanqary A, Almuahaya H, Alrubaiq N

Introduction

Cells in our body are exposed to different types of mechanical stimuli. The ability of cell to react to this stimuli is an important characteristic of cells. White blood cells (WBCs), also called leukocytes, are the cells of the immune system that are involved in protecting the body against both infectious diseases and foreign invaders. WBCs are being exposed continuously to different mechanical stimuli. Different diseases affect WBCs and change their properties. One of the most known diseases affecting WBCs is Leukemia. Leukemia is a group of cancers that usually begins in the bone marrow and results in high numbers of abnormal white blood cells. These white blood cells are not fully developed and are called blasts. Literature lacks on how does leukemia affect the mechanical properties of WBCs, thus, a better knowledge of the biophysical changes including: elasticity and deformability is needed. In our research, we will work on filling this gap in the literature by studying these aspects as it will enhance our understanding of the pathogenesis of the disease. Moreover, this research will give some practical insights on WBCs mechanical properties measurement.

Objectives

- 1- Investigate qualitatively and quantitatively the elastic and viscoelastic properties of leucocytes.
- 2- Since leucocytes are non-adherent cells, we will experiment with coating substrate surface with fibronectin or poly-lysine to stop the cells from moving while undergoing nano indentation.
- 3- To quantify the effects of leukemia and its treatment through characterization of mechanical properties of leucocytes.

Statistics

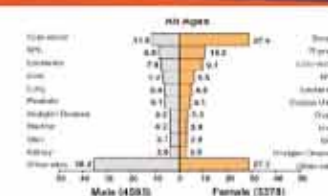


Figure.1: percentage distribution of most frequent types of cancer by sex among Saudis, 2010

Material & Method

Measuring the change in mechanical compliance of WBCs

Sample preparation

This method will be used after the collection of sample, it was adapted from (Melzak, et al, 2015). Firstly, Blood will be collected into phosphate buffered saline (PBS). Secondly, coagulation will be prevented by rapid dilution and rinsing of the samples. Thirdly, Cells will be attached to microscope coverslips that has positively charged layer of

poly(allyamine) hydrochloride. Fourthly, The coverslips will be incubated for 30 minutes in a solution prepared by stirring PAH overnight in 0.5 M NaCl. Finally, The coverslips will be rinsed in water and stored in water before use.

Nanoindentation

The determination of the time-dependent mechanical properties using nanoindentation involves the application of a controlled load to a berkovich indenter, inducing local deformation of the surface beneath the indenter tip. Both the load and the displacement are monitored simultaneously during loading and unloading of the indenter resulting in a load-displacement curve. In this study the load-displacement curve shall be used to characterize the modulus of elasticity of the erythrocytes specimen using the formula

$$E_r = \frac{\sqrt{\pi}}{2} + \frac{(dp/dh)}{\beta\sqrt{A}}$$

Where β is the indenter correction factor and is equal to 1.074 berkovich indenter and A is the contact area approximated by $24.675h^2 + 0.562h + 0.003216$ for berkovich indenter.

Finite Elements Simulation

3D Models

White blood cell: The cell is modeled as a sphere with diameter of 10 μm as shown in figure 2

Indenter: A berkovich indenter is modeled as a rigid body with the standard half angle of 65.3° as shown in figure 2



Figure.2: (a) isometric view of WBC attached to a rigid plate (b) isometric view of the berkovich indenter

Simulation of the indentation process

The loading and unloading process of the WBC is simulated under controlled load conditions. The red blood cell is attached to a fixed rigid plate and is loaded by the indenter with a force of 100 N. The deformation of the WBC is shown in figure 3

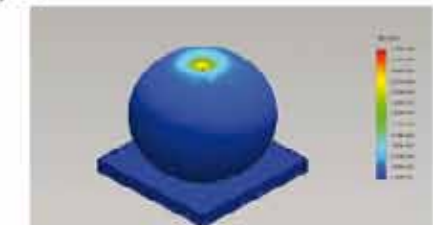


Figure.2: Deformation of WBC under controlled loading conditions

UG-E11-Alrubaiq 2016

Inventory Solutions for Rotary Equipment

Nourah Alrubaiq , Suhailah Alkhawashki , Nada Haboudal

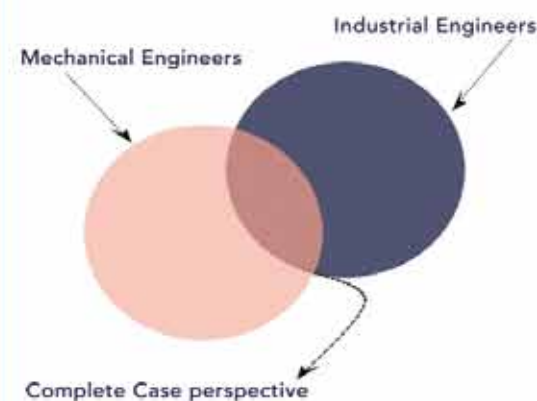
Introduction

Industrial engineers work to eliminate waste of time, money, materials, man-hours, machine time, energy and other resources that do not generate value and replace them with other activities that simplifies the process and generate value.

Abstract

The goal for this project is to implement vertical rotor storage for a specialty workshop due to the large number of rotor projects in the facility. The aim is to decrease the waste and come up with inventory creative solutions with the current capabilities and limitations of the facility. The validation of the solution's success would be incorporating six sigma quality measure in creative way to ratify the proposed output.

Multi Disciplinary Team



Materials and Methods

- 1- Solidworks 3D modeling program
- 2- ANSYS CAD simulation product development
- 3- Rivet building information modeling
- 4- Minitab data analysis quality improvement

Project Approach



Equipment Serviced



Results

- Increase workshop capacity for rotor storage
- Eliminated lean manufacturing waste
- Optimized process for vertical rotor storage
 - Ergonomic design for usability
 - Environment fit for ultra precision equipment

Client

DRESSER-RAND
A Siemens Business

UG-E12-Itani2016

Class Tracking System

Jihad Itani - Abdulrahman Shalash

Project Overview

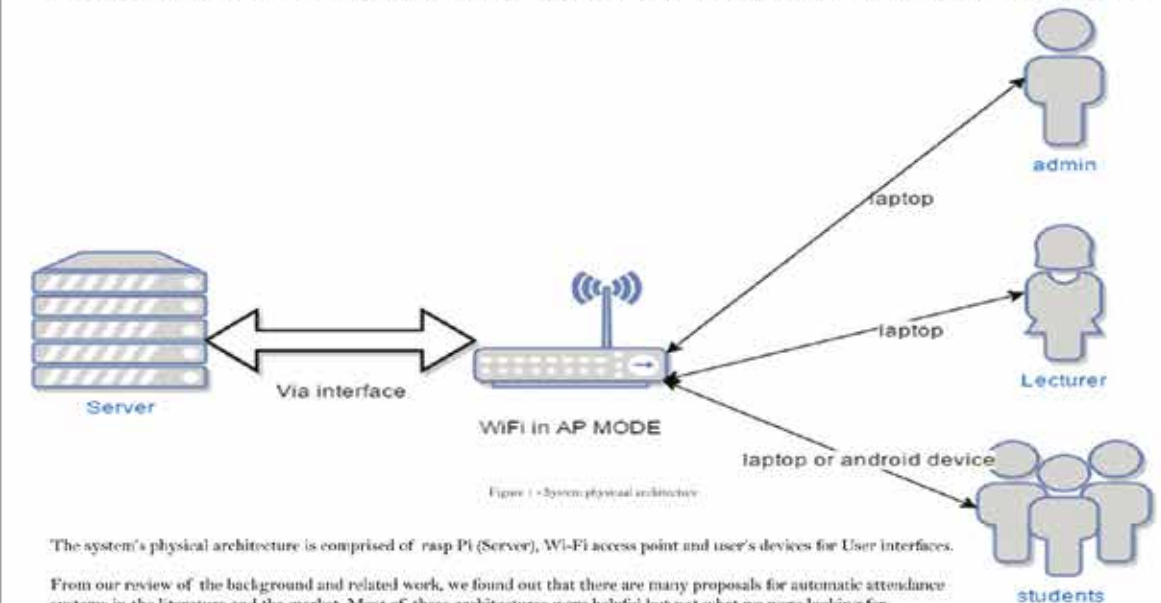
The attendance system for students is an important element that contributes to their performance in their studies. Poor attendance usually results in poor performance. The purpose of our project is to implement an attendance system for students that tracks them real time and gathers statistics and displays them for the students and instructor.

At Alfaisal University the attendance system is quite flawed, since students may come in, mark themselves as present manually and then leave right after having to miss the lecture, which in turn is quite annoying to the professors.

Our goal is to implement an attendance system that will help professors track students' presence during the entire class. Furthermore, classes that exceed 40 students, per section, tend to take a lot of class time solely to take the attendance of every student, which is taken away from teaching. We want to be able to save time, by automating the attendance system so that class time is fully utilized.

Architectural Factors and Decisions

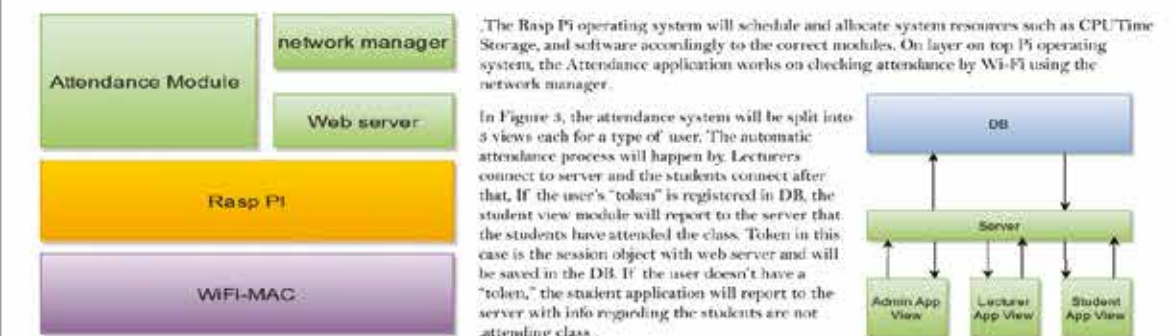
The system architecture herein describes the system and its component in a high level and how basic interactions are made between the different components.



The system's physical architecture is comprised of rasp Pi (Server), Wi-Fi access point and user's devices for User interfaces.

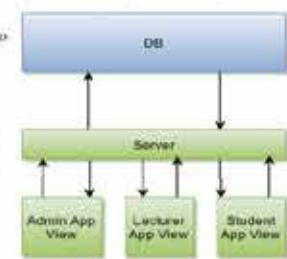
From our review of the background and related work, we found out that there are many proposals for automatic attendance systems in the literature and the market. Most of these architectures were helpful but not what we were looking for.

The overall architecture of our Wi-Fi student tracking system is shown in figure 2. Our system consists of Rasp Pi and the attendance module. Rasp Pi OS is used to check the student's attendance by using Wi-Fi and MAC Protocol. The attendance module uses RESTful open API web service and web client applications. As show in figure 2, our solution only supports Wi-Fi, but can be latter improved to support other type of RF communications.



The Rasp Pi operating system will schedule and allocate system resources such as CPU Time, Storage, and software accordingly to the correct modules. On layer on top Pi operating system, the Attendance application works on checking attendance by Wi-Fi using the network manager.

In Figure 3, the attendance system will be split into 3 views each for a type of user. The automatic attendance process will happen by: Lecturers connect to server and the students connect after that. If the user's "token" is registered in DB, the student view module will report to the server that the students have attended the class. Token in this case is the session object with web server and will be saved in the DB. If the user doesn't have a "token," the student application will report to the server with info regarding the students are not attending class.



Conclusion

To conclude, the Wi-Fi approach does have some flaws. Hence, we are working on an NFC and/or Fingerprint approach which would reduce the loop-hole given to the students. All in all, this should allow saving time for taking attendance.

Code: UG-E13- Ashour2016
Category: Engineering & Technology

Name of project: Eliminating non-value added tasks to increase efficiency.
Authors: Abdullah Almuhanha, Faisal Alawaji and Mohammed Ashour.

Abstract

Alkhorayef Industries manufacture leading industrial, agricultural, irrigation pumps around the world. The company is now one of the biggest four world players in the large-scale irrigation industry but with that comes an increase in demand but also a burden on their production line. Our mission is to increase the efficiency of the current production line for the 11BWH pump by eliminating the non-value adding activities, which will help in decreasing the time needed for production.

Methodology

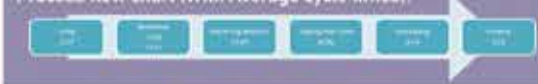
We are using the Lean Six Sigma DMAIC framework, we first (D)efined the project's objectives, scope, and outputs. (M)easure the time needed for each processes/tasks and collect data about the methods used and facility layout. Once we obtained the needed data. We started to (A)nalyze by identifying, validating and selecting the root cause of the problem for elimination by determining the value adding and non-value adding activities and began (I)mproving the current system by modifying or redesigning existing processes and procedures to minimize the non-value adding activities and guarantee a higher efficiency and production rate. Finally (C)ontrol the new process to make sure performance levels are maintained when the implementation of the proposed system happens.



Root Problem & Production processes

After analyzing the different components in the pump, we deduced that the Intermediate case is the bottleneck of the production system and our objective will be to decrease the required time for production by eliminating non-value adding times (Wastes). The production of the intermediate case has several processes.

Process flow chart (With Average cycle times)



8 Wastes: Lean Six Sigma

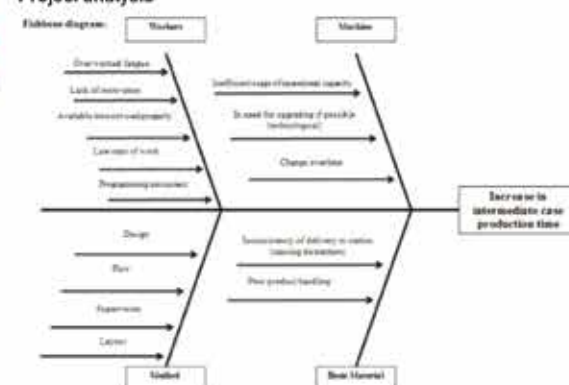


Recommended Improvements

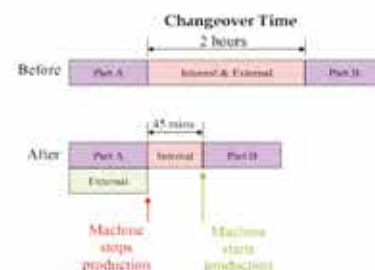
Reduce Changeover time for CNC Machines by implementing Single Minute Exchange of Dies (SMED) or quick changeovers
By converting internal procedures (Tasks done when the machine is not running) to External procedures (Tasks done when the machine is running), the time required for change over will be severely cut.

Reduce movement and transportation distance required
Movement is a non-value adding activity that needs to be minimized and eliminated unfortunately, most of the processes of the Intermediate Case have a lot of movement for the workers and materials that are delaying the production times.

Project analysis



In the fishbone diagram, we can see the different causes that help to produce the root problem. In addition, allows seeing the different areas of improvements that can help to decrease the production time and help us in proposing solution that will help to eliminate these causes.



UG-E14-ALRashed2016

Authors: Faisal Al Saud, Faisal Al Rashed, Saud Al Saud
COE – Industrial

Inventory Control and Improvement

INTRODUCTION

Inventory control is a very essential aspect of every company that can cause a big impact on the company's profitability or loss depending on how it is implemented. In our Capstone project. We decided to implement our technical skills to help company X to improve its inventory control. Improving inventory control will help the company reduce costs in several aspects such as holding cost. Controlling the re-order points and economic order quantities and optimizing it will reduce the holding cost immensely.

By process improvement, such cost cutting can occur. A technique of process mapping and eliminating dispensable processes will be implemented such that we could reduce the overall inventory cost.

Moreover, another benefit of inventory control is minimizing, and eventually, eliminating the risk of inventory shortages. This objective will benefit the company in utilizing and optimizing every process and product coming in and out of the company.

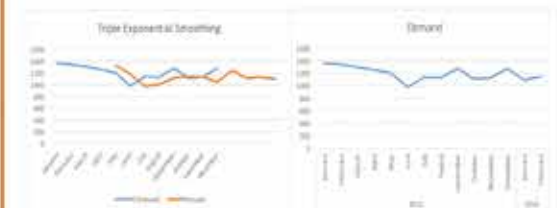
FACTORS AFFECTING DEMAND & COST

Internal Factors:

- Facility
- Purchase Cost
- EOQ

External Factors:

- Oil
- Politics
- Electricity
- Vacations
- Competition



OBJECTIVES

- Find the best forecast that suits the company
- Find current total inventory cost
- Reduce total inventory cost

METHODOLOGY

- Calculate total inventory cost using EOQ models
- Map the processes that are linked directly to the inventory
- Process improvement to reduce total cost
- Introduce innovation
- Analyze the total cost of innovation to find out its feasibility



Modeling and simulation of buildings based on renewable energy

Authors

Jaweria Ali Imran & Dr. Souraya Gouniri-Said

Abstract

Energy demand is increasing by individual as our fossil resources are decreasing. In time being, we are limited to look for new renewable resources for energy. In the present proposal, we would like to address this challenging topic from computational simulation point of view. As future engineer, we are asked to optimize all the important parameters regulating our building consumption of energy in order to plan the future construction and heavier models. Simulation is an economic tool (time and money) to perform such work and predict new materials by considering weather conditions and geography with the use of renewable resources. We would like to present a model and simulation results for the most optimized building by running solar heat and photovoltaic and the most efficient materials in building design. The need of energy storage is also an important parameter to consider as it is known that the solar power high peak is at noon while the Saudi society is in need for energy in the morning and evenings. Adapting building in these two scenarios might be realized by computational application.



1. Introduction

Being the 41st most populated country in the world is taking a toll on Saudi oil reserves. Energy demands keep on increasing at an exponential rate and natural resources are depleting in an equally opposite way. Fortunately, Saudi Arabia's location gives it a huge edge in meeting its growing energy demands with the help of solar radiation. We will study the potential for introducing solar panels on each house and building in Saudi Arabia by modeling based on one structure—Alfaisal University (AU).

2. Modeling and Computation

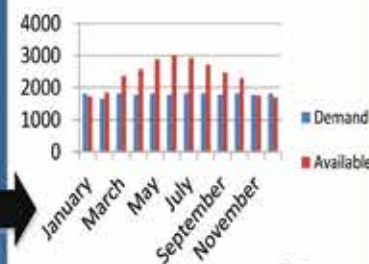
We used a solar photovoltaics software (PVyst) to analyze a preliminary stand alone simulation of solar energies for AU. We took into considerations the estimated number and kind of applications in AU (AC's, LED's, etc.) and the average power associated with each of them. Various computational simulations were performed by the software, in which mathematical modeling was done using the principles of the standard equation for a one-diode model.

$$I = I_{ph} - I_0 \left[e^{\left(\frac{V + I R_s}{n R_{sh} k T_c} \right)} - 1 \right] - \frac{V + I R_s}{R_{sh}}$$

3. Results

The software gives a series of demand and available energy and consumption and production simulation. It also gives a detailed account of the all the energy flows and gives a detailed account of the energy demands and availability. The simulation also shows the energy flows and gives a detailed account of the energy demands and availability. The simulation also shows the energy flows and gives a detailed account of the energy demands and availability.

Energy - Demands & Availability (kWh)



As we can see from the graph, the monthly solar energy is more than enough to compensate for monthly demand. The investment cost for setting up the power is estimated to be around 411773.37 SAR. Initial costs are high, but return on investment is predicted to show within one year.

4. Conclusion

Saudi Arabia's energy demand is on the rise and then the like simulations are the key to predicting all forms of energy demands in the Kingdom. For safeguarding the future, one must start integrating solar PV into our buildings in order to "future-proof" them. The materials and PV system design may differ for different needs and areas in the country, and these simulations provide one what the construction companies require in order to find the optimal layout; they can validate measurements, spot faults and even detect potential problems.

5. References

UG-E15-Alshehri2016

Building Performance Development

For Eshraq ALBalad Cultural & Community Center

Research

Introduction

Location & Discription

The project is located north east of Riyadh, Saudi Arabia, adjacent to AlWurud neighborhood, and has access to the two main roads: King Abdul Aziz Rd. and Urubah Rd. and has one of the main metro lines passing alongside the site; the project was made for public use and to benefit the community, creating a safe social space where people of all ages and social groups can come together, and interact.

Abstract

This research shows the progress of improving the performance of the building by undergoing different analysis to achieve the LEED 2010 goal and different phases with regards to the following aspects:

- Energy Consumption
- Efficient Use of Daylighting
- CO2 Emissions
- Water Consumption

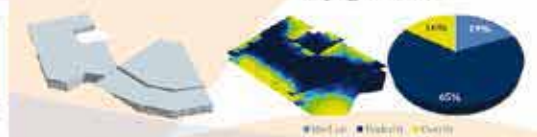


Building Performance Analysis

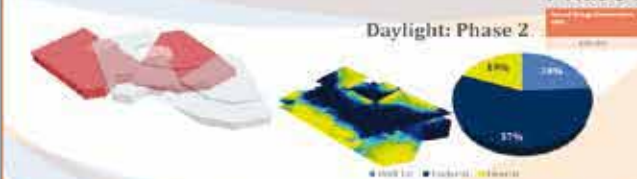
Phase 1 After running the analysis on our initial model (no changes) the following results were found:



Daylight: Phase 1



Phase 2 In this phase the building had been shifted and raised so that most of the building is facing north:



Daylight: Phase 2



by making this change the daylighting quality within the building improved by 6%, the energy consumption was reduced by 63% saving 7,000,893 kWh annually.

Phase 3 In this phase horizontal shading was added above the large windows located in the west:

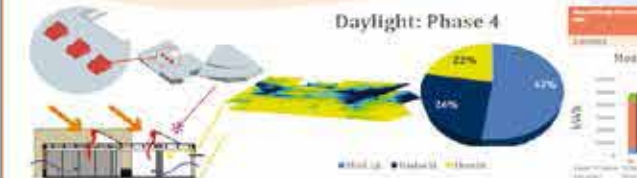


Daylight: Phase 3



by making this change the daylighting quality within the building improved by 31%, the energy consumption was reduced by 68% saving 7,633,475 kWh annually.

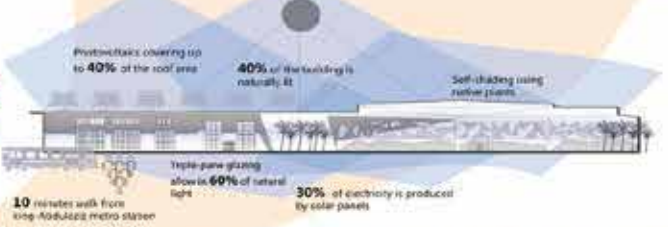
Phase 4 In this final phase we added skylight openings on the roof for the sake of daylighting and natural ventilation, and implemented some system changes:



Daylight: Phase 4



By applying the overall changes to the building we saved 705,472 m³ of water, and received a 23% profit of 915,240\$ annually.



Yara ALShehri - Adnan ALJabbar - Hagar Faris - Reema ALDabbas

UG-E20-Alsaadon2016

Nebula: Home Automation Internet of Things Framework

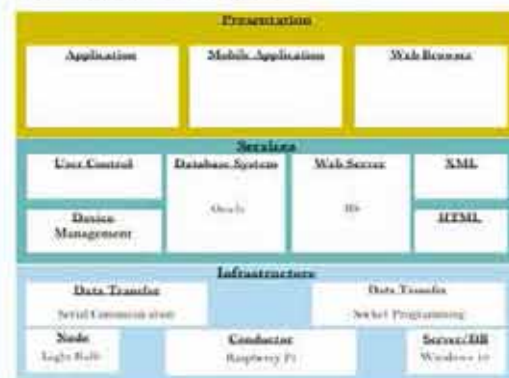
Abstract

Design and implement a framework to be utilized in creating a home automation system through the technologies of the Internet of Things (IoT). The framework would be used for identifying, managing and controlling devices in households. Through the framework's interface the users would be able to identify the various devices in their environment and would be allowed to control them, monitor their activities, and produce different statistics about the devices.

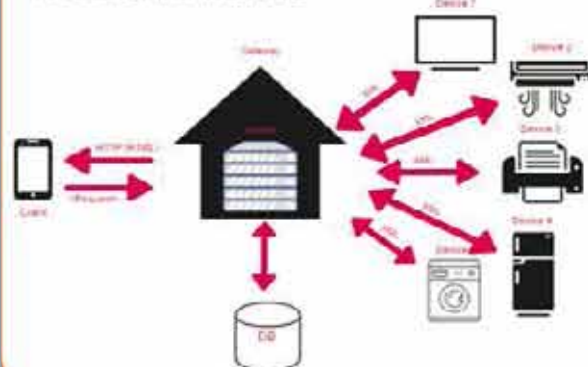
Framework Features

- Nebula must allow different types of devices to communicate with the gateway
- Makes your home appliances easily accessible
- Protocols:
 - For the device to be able to describe itself to the server (multicast)
 - For the server to uniquely identify a device
 - For the server to provide the user with a dynamically generated UI for remote and direct access for monitoring and controlling the equipment.

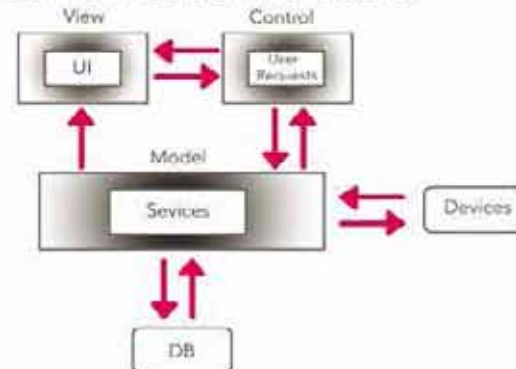
Framework Structure



Nebula Architecture



Model-View-Control Architecture

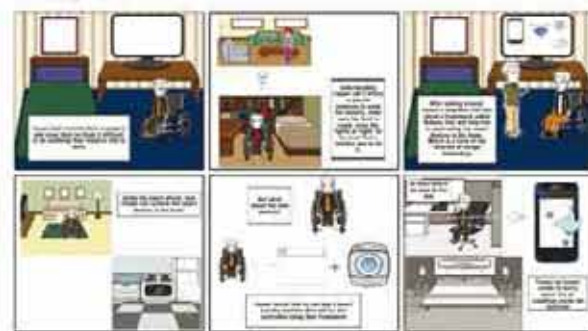


Implementation

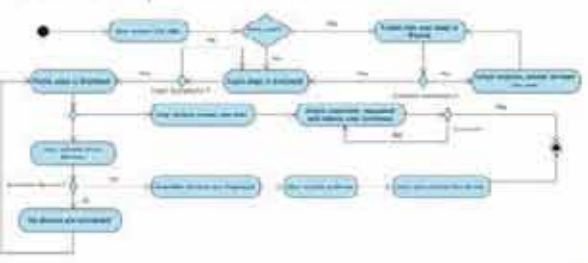
- Development tools: ASP.net, C and Python.
- Prototype



Storyboard



User's Experience Flowchart



Energy Performance: The neighborhood library

Challenge:

The region suffers from many social and environmental challenges. Challenges presented with the growing aging population in the kingdom, and the inadequate accommodation for this aging group within the built environment and the society, along with the exorbitant heat that the region and its built environment suffer from.

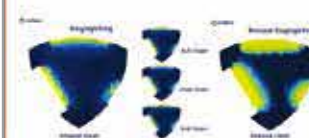
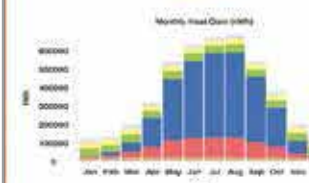
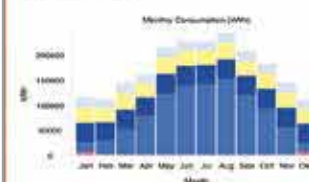


Solution:

The building is designed to not only accommodate the elderly population properly and ease their movement within the spaces, but to also integrate them with the community by providing space for social and educational development. The building is equipped with workshops and lounges where the elderly and the youth can come together, share experiences, and learn from each other. Focusing, of course, on the learning segment of the society.

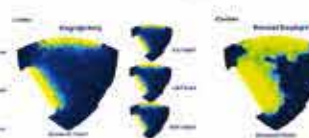
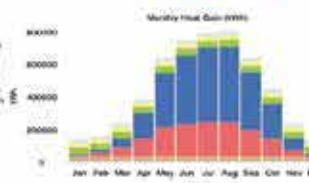
Basic

The basic design of the building suffers from very limited natural light introduced and very irritating glare into the space. The conventional methods of construction and building technologies offers very little insulation and energy conservation privileges for the building.



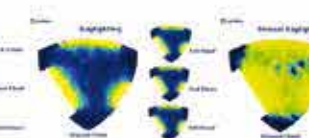
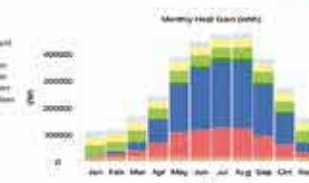
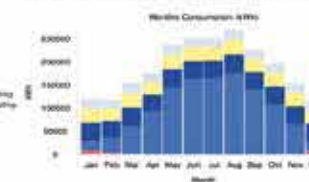
Intermediate

By introducing vertical shading elements to the façade of the building, the daylight and daylighting factor start to experience an increase. As well as the building starts to get better natural lighting annually along with a huge reduction in the glare introduced to the space.



Advanced

By implementing smart systems and integrating smart energy reduction techniques with the design, specially high reflecting and high light transmissivity, the natural lighting into the space starts to increase annually. The space experiences noticeable decrease in glare despite the increase in natural daylight.



Karim Sarraj, Mohammed Mansour, Mohammed Aljabeen

3rd Prize Winner

Energy Reduction in Sunny Side hotel

Background

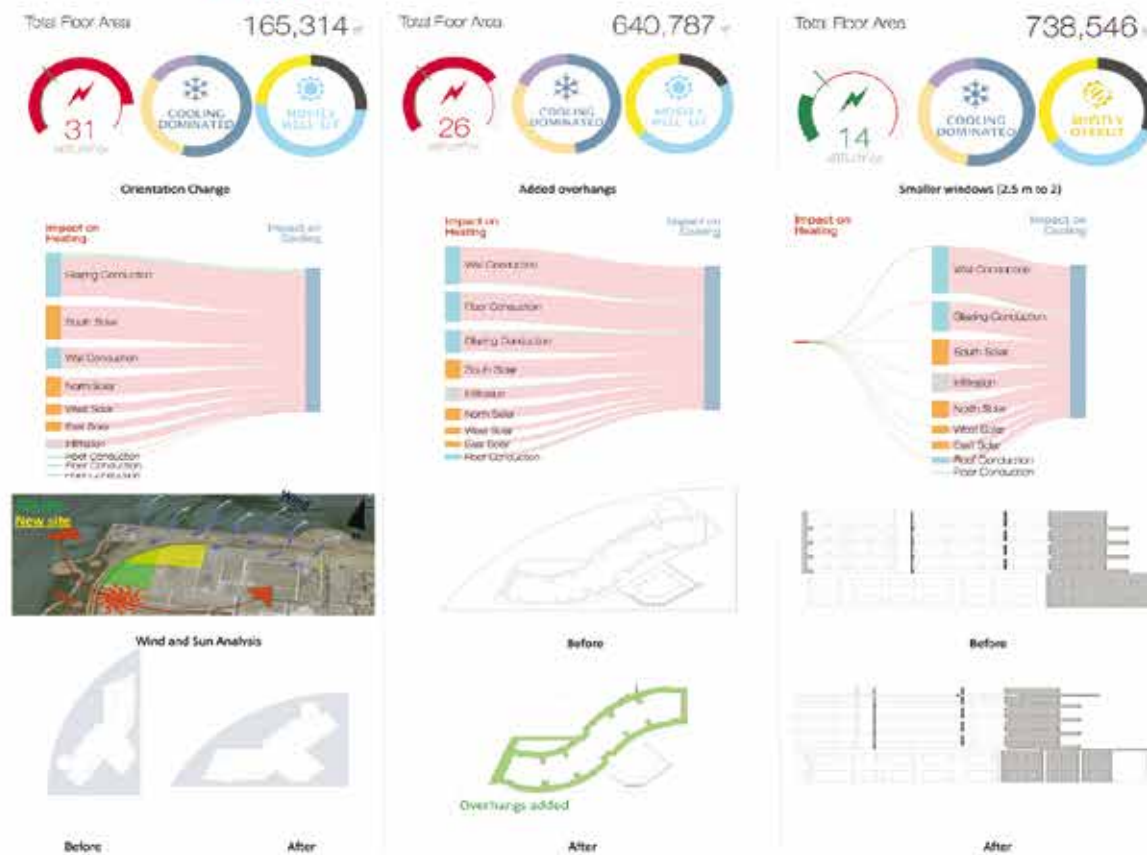
The Sunny Side Hotel is a family hotel we have designed to be located in Dammam, Saudi Arabia. The site overlooks the sea on the north and west sides. Due to the building's irregular shape and large number of windows the energy use of the building is excessive. For this research we are attempting to use simple changes to decrease the energy use without compromising the design.

Methods

The first attempt is changing the orientation of the building so that a shorter side would be facing the west rather than the longer side to avoid the sun heat. **CAN JUSTIFY X 1**

The second attempt is to add overhangs to shade parts of the building to decrease sun light entering the building.

The third attempt is to decrease the height of the room windows slightly to decrease the heat gain and sunlight.



Conclusion:

After the minor changes we've made and selected methods, the change in energy efficiency and usage is clear and satisfactory. By doing so we managed to save energy and cost on electric bills with minimal damage to the design and budget of this project. This proves that simple methods such as the ones we've used in this research can in fact be used to optimize energy while not affecting the design in the slightest, especially if implemented in the earlier stages of the design.



Ahmed Zaher Hassan 130089
Ibrahim Alamoudi 120314
Abdulrahman Almoeqel 120459

Almadinah Islamic Center

Project Statement

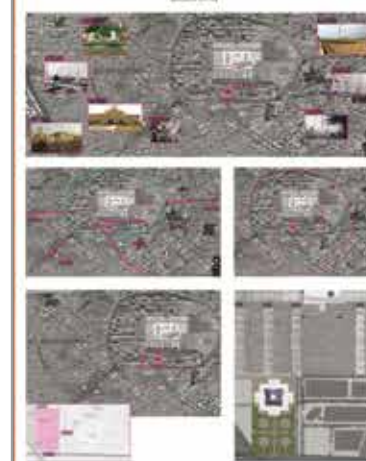
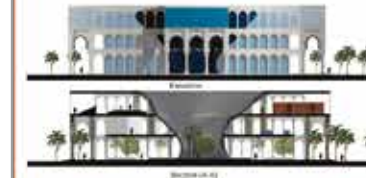
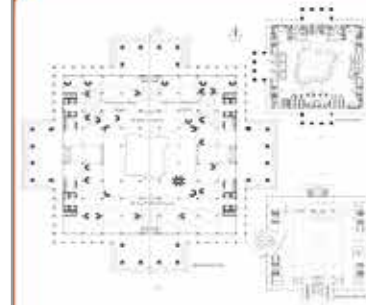
The project is a mosque to be located in the center of the city of Dammam, Saudi Arabia. The site is a rectangular plot of land, 100m wide and 150m deep. The project is a mosque to be located in the center of the city of Dammam, Saudi Arabia. The site is a rectangular plot of land, 100m wide and 150m deep. The project is a mosque to be located in the center of the city of Dammam, Saudi Arabia. The site is a rectangular plot of land, 100m wide and 150m deep.

Concept

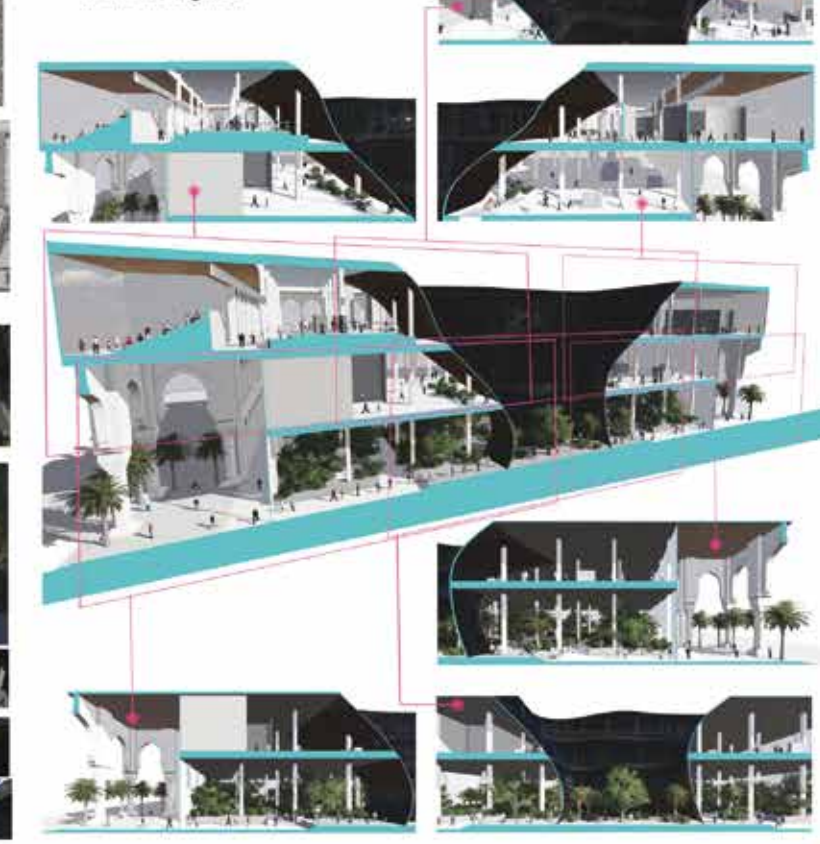
The concept is to create a mosque that is a landmark in the city of Dammam, Saudi Arabia. The mosque is to be a landmark in the city of Dammam, Saudi Arabia. The mosque is to be a landmark in the city of Dammam, Saudi Arabia. The mosque is to be a landmark in the city of Dammam, Saudi Arabia.

Programmatic Features

The mosque is to be a landmark in the city of Dammam, Saudi Arabia. The mosque is to be a landmark in the city of Dammam, Saudi Arabia. The mosque is to be a landmark in the city of Dammam, Saudi Arabia. The mosque is to be a landmark in the city of Dammam, Saudi Arabia.



Building anatomy, re-examination of the courtyard.



Medicine & Health





G-M07-Zahid 2016
Research

Interplay of BPTF Mediated Chromatin Remodeling and Transcription Factor MZF1 in Cardiac Hypertrophy Regulation

Esra Zahid¹, Salma Mahmoud², Coralie Poizat²

1. Master of Biomedical Sciences (Molecular & Cell Biology), Al-Faisal University
2. Cardiovascular Research Program, King Fahad Specialist Hospital & Research Centre

Introduction

Heart failure is a major cause of mortality in Saudi Arabia and has a high impact on the economy. Recently, our understanding of epigenetic mechanisms governing gene regulation and expression has increased radically. Yet, the associations between changes in the epigenome and pathological conditions such as heart failure are poorly understood and of great interest to the scientific community. Thus, we examined epigenetic changes in several histone modifications and chromatin remodeling factors in human failing hearts. Among the highly dysregulated factors was the Bromodomain PHD finger transcription factor (BPTF). BPTF plays an important role in chromatin remodeling and heart development; however its functional role in cardiomyopathy progression is unknown.

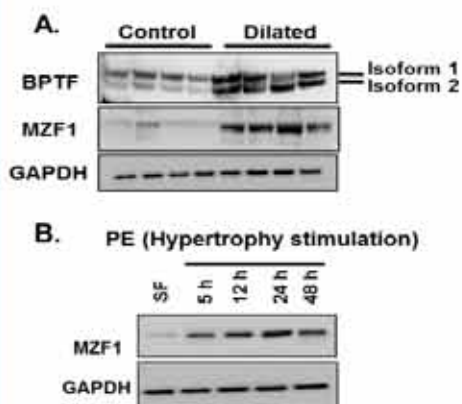
Objectives

• This study aims to investigate the mechanism by which BPTF expression is increased in human failing hearts.

Methodology

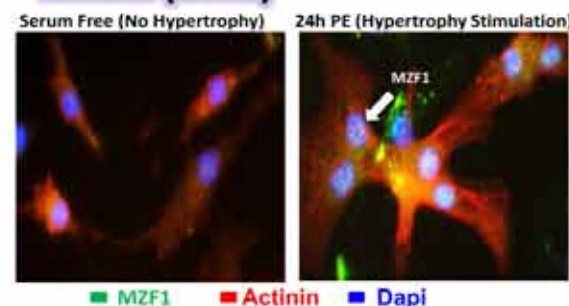
- Several experimental approaches were used:
- 1. Indirect immunofluorescence microscopy.
- 2. Immunoblotting.
- 3. Immunoprecipitation.
- 4. Gel shift assay.

Results

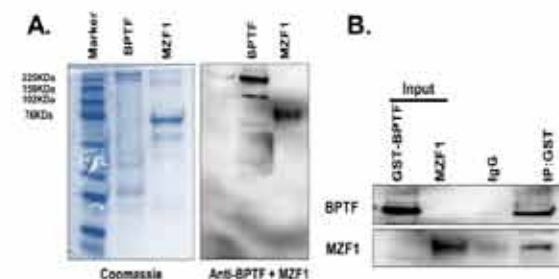


• Fig.1: Increased BPTF and MZF1 in A) human failing hearts and in B) cardiomyocytes after stimulation with the hypertrophic agonist phenylephrine (PE).

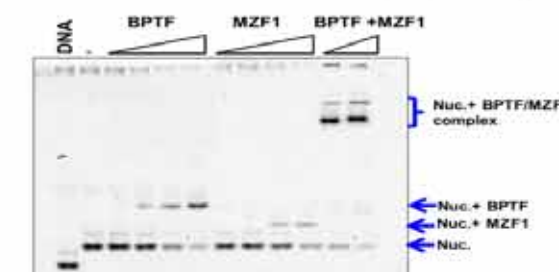
Results (Cont.)



• Fig.2: Increased MZF1 level in cardiomyocytes after 24h PE treatment



• Fig.3: A. purification of BPTF and MZF1 protein. B. In vitro interaction of BPTF and MZF1 factors by immunoprecipitation assay.



• Fig.4: Increased interaction between BPTF and MZF1 in the context of the chromatin by gel shift assay.

Conclusion

• Our results show increased expression of BPTF and MZF1 in human heart failure. MZF1 protein is also increased in cardiomyocytes undergoing hypertrophy. Finally, BPTF and MZF1 interact with one another. These data suggest novel insights into mechanisms regulating heart failure implicating chromatin remodeling through BPTF and MZF1 factors.

Future Directions

• Study the effect of MZF1 on BPTF remodeling activity and the implication of this interaction on hypertrophy status.

* This work was supported by grant 10-BIO 1350-20 from King Abdulaziz City for Science and Technology.

Attitudes of Saudi Arabian Undergraduate Medical Students towards Health Research

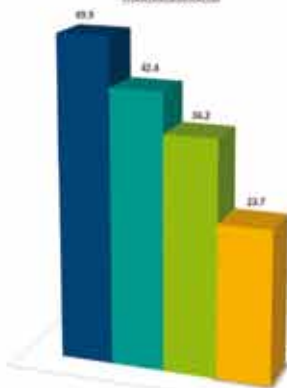
Abdullah M AlShehri, 5th Year Medical Student at Alfaisal University

Introduction: Kingdom of Saudi Arabia is increasingly focusing on strengthening the national education and health systems. This study aimed to evaluate attitudes, perceptions and perceived barriers towards health research among Saudi Arabian undergraduate medical students

Methods: This cross-sectional study took place between August and October 2014 and included 520 students from five medical schools across Saudi Arabia. An anonymous online survey with 21 close-ended questions was designed to assess students' attitudes towards research, contribution to research-related activities, awareness of the importance of research, perception of available resources/opportunities for research, appreciation of medical students' research contributions and perceived barriers to research. Responses were scored on a 5-point Likert scale



Perceived barriers for undertaking research among medical students



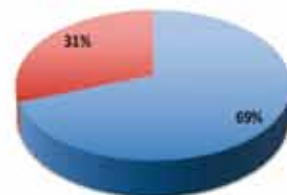
Time constraints: 49.9% of students believed that there is no sufficient time to perform research during medical school.

Lack of research mentors: 23.7% believed that they did not receive sufficient training.

Lack of formal research methodology training: 42.4% believed that they did not receive sufficient training.

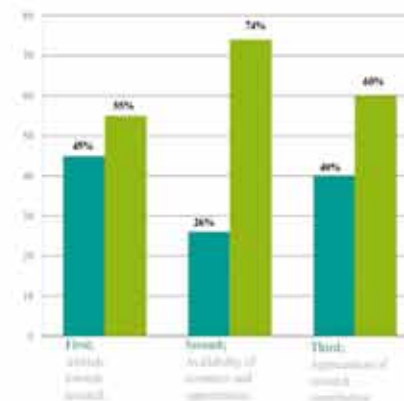
Difficulties in conducting literature searches: 36.2% believed that the non-availability of mentors is the main barrier.

Male to Female ratio



Discussion: Medical students in the current study revealed four main barriers to conducting research, including time constraints, lack of mentorship and inadequate training in literature searches and research methodology. Similar barriers to research were reported by medical students in Canada. More than half of the students believed that research was relevant to medical education in Saudi Arabia. These findings imply that, with effective policies and opportunities, current medical students will soon be willing to participate in research and further increase Saudi Arabia's ranking in the near future.

Results: A total of 401 students participated in the study (response rate: 77.1%). Of these, 278 were female. A positive attitude towards research was reported by 43.9% of the students. No statistically significant differences were observed between genders with regards to attitudes towards and available resources for research. Clinical students had a significantly more positive attitude towards research compared to preclinical students. Only 26.4% of the respondents believed that they had adequate resources/opportunities for research. According to the students, perceived barriers to undertaking research included time constraints (49.9%), lack of research mentors (23.7%), lack of formal research methodology training (42.4%) and difficulties in conducting literature searches (36.2%)



Conclusion: Less than half of the surveyed Saudi Arabian medical students had a positive attitude towards health research. Medical education policies should aim to counteract the barriers identified in this study.

Poster Code: UG-M03Marashli 2016
Category: Research

Heart Rate Variability and Outcomes Prediction in Critical Illness

Nawal Salahuddin, Bander AlGhamdi, Qussay Tamim Marashly, Khaled Juan Zaza, Mohammad Sharshir, Moazzum Khurshid, Zeeshan Ali, Melissa Malgago, Mouhamad Ghyath Jamil, Azam Shafquat, Mohamed Shoukri, Mohammed Hijazi.

Departments of Adult Critical Care Medicine, Nursing, Heart Center, King Faisal Specialist Hospital & Research Centre, Riyadh, Saudi Arabia
Alfaisal University, Riyadh, Saudi Arabia

INTRODUCTION

Heart Rate Variability (HRV) is an indicator of the dynamic equilibrium between the sympathetic and parasympathetic divisions of the autonomic nervous system. We hypothesized that baseline HRV variables and changes in these during resuscitation, may assist in predicting outcomes of critical illness

METHODS

This was a cohort study of inpatients that required a Rapid Response Team (RRT) consultation. Patients without the exclusion criteria of atrial fibrillation, ventricular arrhythmias, bigeminy, trigeminy or cardiac pacing, were attached to 24-hour holter monitoring and serial measurements of physiological and biochemical data were made. Heart rate variability (HRV) was measured as time domains measured over 24 hours (SDNN, ASDNN, rMSSD, pNN50%, SDANN, mean NN) and frequency domains measured hourly (Very Low Frequency VLF, Low Frequency LF, High Frequency HF, Low/High ratio). The study protocol was approved by the institutional Research Ethics Committee (RAC No. 2151069).

RESULTS

53 patients were enrolled, mean APACHE II score was 23.5 ± 6.3 , age 52 ± 24.3 years. Day 1 SOFA score was 8.9 (range 1, 23). Forty patients (75.5%) required ICU admission; ICU mortality rate was 27.5%.

HRV was significantly higher in RRT consultations who did not require ICU admission; time domains; ASDNN [33(IQR21) vs 18(IQR21), $p=0.024$] and rMSSD [23(IQR19) vs 15(IQR18), $p=0.036$] and frequency domains; meanVLF [16.6(IQR7.3) vs 9.3(IQR10), $p=0.018$], meanLF [12.4(IQR11) vs 5.4(IQR7), $p=0.009$], meanHF [9.3(IQR12) vs 4.8(IQR7), $p=0.011$].

HRV, at baseline was significantly higher in patients that survived ICU admission; ASDNN [31.5(IQR24) vs 12(IQR9), $p=0.002$], rMSSD [25(IQR19) vs 11.5(IQR10), $p=0.012$], pNN50% [6(IQR9.5) vs 0.75(IQR2.5), $p=0.002$], meanNN [732.5(IQR291) vs 570(IQR87), $p=0.006$], meanVLF [12.1(IQR11.8) vs 5.3(IQR4), $p=0.002$], meanLF [8.5(IQR10.2) vs 3.4(IQR4.6), $p=0.009$], meanHF [7.5(IQR6) vs 3.3(IQR3.9), $p=0.005$].

ICU survivors also demonstrated a significantly larger increase in HRV over 24 hour period of resuscitation; deltaVLF [3.2(IQR5.9) vs -0.3(IQR7.6), $p=0.017$].

CONCLUSION

HRV analysis appears to be a powerful identifier of outcomes in critical illness. Baseline values and changes over the first 24 hours of resuscitation accurately predicted both the need for ICU admission and survival.

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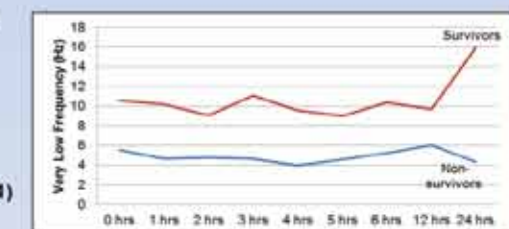


Figure 1: Trends in Very Low Frequency domain of heart rate variability over the initial 24-hour period. *Significance at p value < 0.05 .

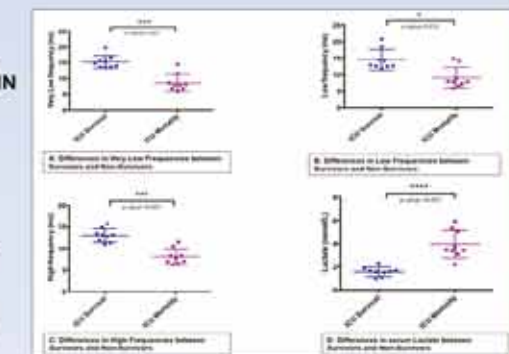


Figure 2: Differences in very low frequency, Low Frequency, High Frequency domains, and Lactate levels between ICU Survival and ICU Mortality groups

Research
UG-M09-Zaza 2016

Prevalence of IL28B Gene Variants Among The Saudi Population and A Guide to Interferon Alpha Treatment in Saudi HCV Patients

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²Strategic Center for Diabetes Research, College of Medicine, King Saud University, Riyadh, Saudi Arabia
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Introduction

Hepatitis C virus (HCV) infects nearly 3% of the World's population and is the major etiological agent behind liver disease¹. Chronic HCV infection is still a major cause for developing cirrhosis and hepatocellular carcinoma, which often results in liver failure and according to the World Health Organization (WHO) is the leading reason for liver transplantation.

Several IL28B gene single nucleotide polymorphisms (SNPs), previously identified in genome-wide association studies have been shown to influence sustained virologic response (SVR) to Pegylated interferon alpha and ribavirin (PegIFN/R) in chronic HCV genotype 1 patients². However, data regarding patients infected with HCV genotype 4, the predominant genotype in Saudi Arabia and the Middle East, where therapy is not even effective in half the patients, is scarce³⁻⁴. Therefore, the same cannot be assumed while treating genetically divergent populations infected with the HCV.

We employed the recent breakthrough in pharmacogenetics to analyze the genetic polymorphisms near the human IL28B gene and their associated differences on the outcome of PegIFN/R therapy in chronic HCV patients.

Aims

- Study the association between host IL28B SNPs persistent in genotype 4 Saudi HCV patients and their response to combination therapy.
- Demonstrate the frequency of good/poor HCV responders to therapy in relation to their IL28B SNPs.
- Evaluate a molecular diagnostic system that can be routinely used in the workshop of HCV patients.
- Encourage the possible use of IL28B testing in the clinical management of HCV patients.

Methods

DNA was extracted from 300 normal Saudi subjects visiting the blood bank and 48 chronic HCV patients undergoing treatment with PegIFN/R standard therapy at our hospital. Study subjects were analyzed and genotyped for three IL28B SNPs: rs12979860, rs12980275, and rs8099977 previously identified in genome wide analysis. HCV viral load tests, RNA extraction/reverse transcription, and sequence genotyping were performed.

Results

Genotyping of the control samples for the SNPs yielded the following: rs12979860 (53% CC, 37% CT, and 10% TT), rs12980275 (54% AA, 37% AG, and 9% GG), rs8099977 (25% TT, 25% GT, and 50% GG).

As for the patient sample, two HCV genotypes were mainly observed, genotype 4 (65%), and genotype 1 (33%) (Figure 1). Genotyping for the aforementioned SNPs among the patients however were divided into two groups each CC/Non-CC for rs12979860, AA/Non-AA for rs12980275, and GG/Non-GG for rs8099977. Each SNP was further distributed into responders, non-responders, and interrupters for patients who had a sustained virologic response (SVR), were partial or non-responders, and those who either did not complete treatment or did not have viral loads post treatment, respectively (Figure 2). Five patients (10%) out of the total 48 HCV patients tested had contradicting responses relative to their predicted response in relation to their IL28B SNPs, four of which had a SVR and one who had a negative response to PegIFN/R.

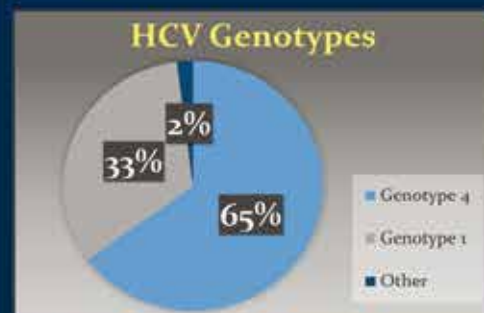


Figure 1: HCV genotypes among patient sample.

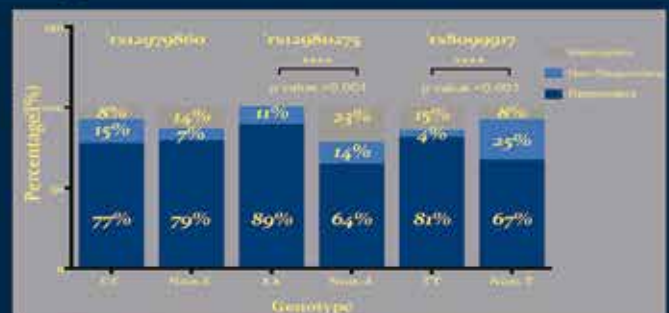


Figure 2: Treatment results according to the three IL28B SNPs.

Conclusions

Our results reconfirmed the predominant HCV-G4 among our patients. Furthermore, a SVR was significantly associated with the AA and TT alleles of rs12980275 ($p < 0.001$), and rs8099977 ($p < 0.001$) respectively. The contrasting responses to PegIFN/R therapy could possibly be due to underlying tribal/ethnic variations between patients, which we are planning to associate among three major separate cities in Saudi Arabia (Makkah, Madinah, and Jeddah) as part of our future patient recruitment and comparison with other populations.

The epidemiology of HCV infections in the developing world and Saudi in particular has not been well characterized. Despite the approval of newer antiviral agents, Peg-IFNα/RBV therapy remains part of the accessible yet costly, triple therapy regimen recommended for patients. An enhanced depiction of HCV response to treatment in genotyped patients will be cost effective to health care delivery systems in the Arab world and contribute to the road towards personalized medicine in the future.

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Characterization of the functional role of Bromodomain PHD finger transcription factor (BPTF) in heart failure

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جامعة الملك فهد
KFHSRC



Introduction

Gene activation or repression depends profoundly on the dynamic of the chromatin structure. Alteration of chromatin architecture through ATP-dependent remodeling factors and histone modifications allow the conversion of inaccessible or repressive heterochromatin to the accessible or active euchromatin state of DNA. Chromatin remodeling and modifications are classified as epigenetics processes that govern gene expression and regulation. The epigenetic control of cardiac hypertrophy represents a novel mechanism for regulating gene expression in the heart.

Objective(s)

Examining the role of chromatin remodeling enzyme BPTF in adult cardiac hypertrophy progression

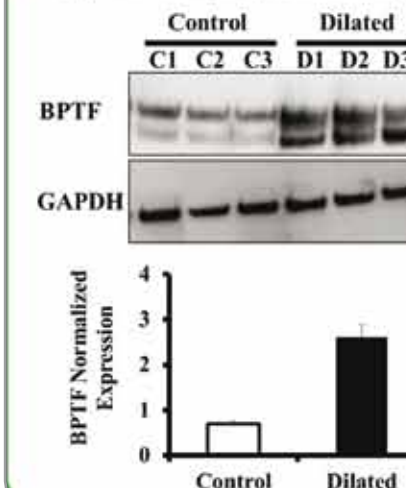
Methodology

Several techniques were used in biopsies from human failing hearts, animal models and neonatal cardiomyocytes including:

- Immunoblotting
- Indirect Immunofluorescence techniques in

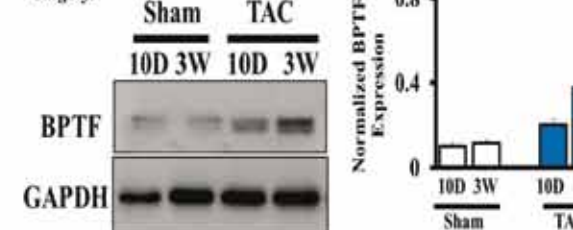
Results

- Fig.1: Increased BPTF Expression in human failing hearts.

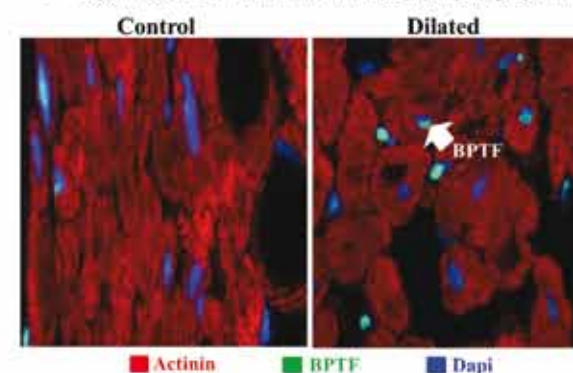


Results

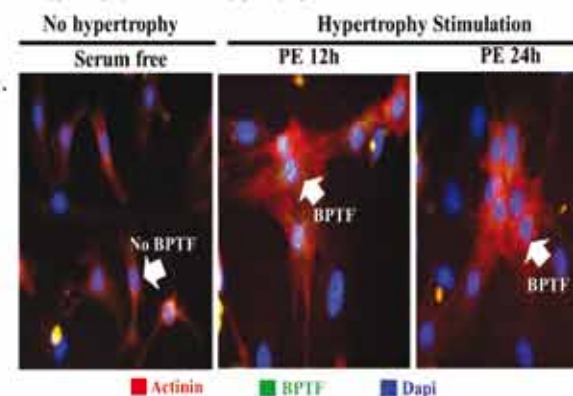
- Fig.2: Increased BPTF expression in mice hearts subjected to TAC surgery.



- Fig.3: Increased BPTF level in cardiomyocytes in failing myocardium.



- Fig.4: Up-regulation of BPTF expression in cardiomyocytes after hypertrophy stimulation by phenylephrine (PE).



Conclusion and future directions

- Our data suggest that BPTF is a novel regulator of heart failure.

- Findings obtained from this investigation will provide information that can be used to design new therapeutic targets for the treatment of major cardiovascular diseases in human.

* A. Acknowledgment: This work was supported by grant 15-MED416-20 from King Abdulaziz City for Science and Technology.

M11-SARKAR
Research

High Anorectal Malformation without Fistula: the KFSH experience

Abdullah Sarkar¹, Anas Abudan¹, Mohammed Mourad¹, Saud AlShanafey^{1,2}

¹ Alfaisal University, ² KFSHRC

Introduction

- Anorectal malformations (ARM) refers to congenital imperforate anus.
- Occurrence of 1:3500 live births.
- Imperforate anus is described as the failure of the rectum to descend through the external sphincter complex^{1,2}.
- Reports of surgical management started from 7th century with a highly morbid procedure by Paulus Aegineta³.
- Anorectal malformation is a common congenital defect that presents with a combination of several anomalies.
- Of the categorical presentations, **no fistula type ARM** has recently been investigated and reported on as its own disease in the literature.

Methods

- Retrospective review of medical records of patients with no fistula ARM and fistula-ARM patients for the period between September 2000-January 2015.
- Total cases: 60.
- Demographic, anatomic, and outcome information were obtained for each group and compared ($p=0.05$).
- IRB approval was obtained from KFSHRC.

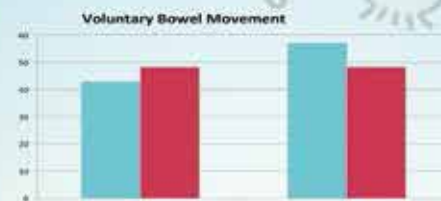
Results

Gender
M: 56 – F: 4
Surgical Age: 9 months (± 6.6)
Current Age: 9 years (± 4.4)
No fistula ARM: 16
Fistula-ARM: 44

	Non-fistula ARM	Fistula-type ARM	p-value
Downs Syndrome	56.2%	0	<0.0001
Associated Anomalies	68.8%	43.1%	0.0331
Laparoscopic	75%	90.9%	0.3554
Loop Colostomy	87.5%	95.5%	0.2871

Quality of Life

	P-value
Voluntary Bowel Movement	0.3902
Soiling	1.0
Constipation	1.0



Aims

As pediatric surgeons globally have identified unique characteristics associated with no fistula type ARM, we aim to report our experience, management, and outcome.

Conclusion

- In our study sample, associated congenital anomalies had a higher incidence in N.F-ARM vs F-ARM.
- Quality of life results showed similar habits.
- Hence, the outcome of management was not found to have any significant difference.
- Our results support claims of non-fistula type ARM being an individual disease. However the management based on outcomes, does not need to differ.

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UG-M13-Raja2016-
RESEARCH

Zika's Link to Microcephaly and Guillain-Barre Syndrome- Why Evidence Leads to Association without Being Cause-Effect Proof

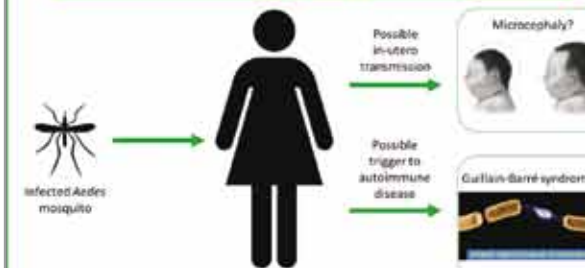
Rawia Raja*, Faris Raja*, Fahad Raja*, Al-Anoud Raja* and Jose Rey-Ladino¹

*Medicine; ¹Microbiology and Immunology. College of Medicine, Alfaisal University

Introduction

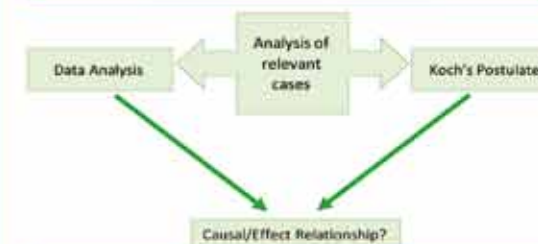
- Recent outbreak of ZIKA Virus (ZIKV) in Brazil and other parts of South America have suggested a link between ZIKV and GBS and microcephaly.
- The suspected direct link between ZIKV and microcephaly and GBS is an urgent global health concern including KSA.
- Here we argue that although association between ZIKV and these diseases do exist, direct cause-effect link is currently lacking.

Objective



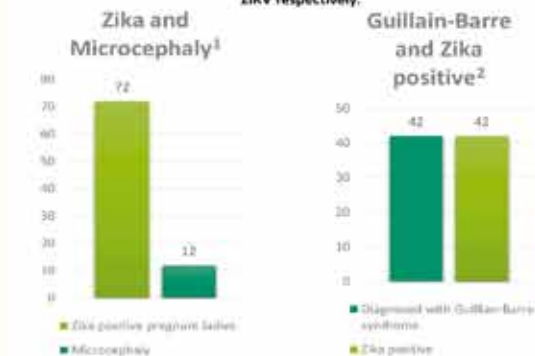
is there a cause and effect relationship between Zika virus and microcephaly/Guillain-Barre syndrome?

Methods and Materials



Results

Figure 1. Studies linking microcephaly (Brazil) and GBS (French Polynesia) with ZIKV respectively.



References

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Table 1. ZIKV and microcephaly- case report⁴

Study type	Ref cases	Zika +ve	Fetal microcephaly/other CNS virus	Remarks	Conclusions
Case report	1 pregnant woman	1	1	Virus was isolated from brain of fetus with microcephaly	Strong evidence of Zika causing microcephaly

This case showed strong cause-effect association between ZIKV and microcephaly.

Table 2. Morbidity and Mortality weekly report- Brazil 2015⁴

Periods of observation	Cases of microcephaly per year per 10,000 inhabitants	Presence of Zika virus
2000-2014 (14 years)	574	Not determined
2015-2016 (1 year)	157	Cases of microcephaly coincided with the outbreak of Zika virus epidemics (particularly in North Eastern states)

Although this study points to ZIKAV's role in microcephaly during 2015-16 outbreak, there are problems in this study mainly related to ZIKAV diagnosis, potential inclusion of false positives as well as problems of microcephaly diagnosis.

Conclusions

To decide if an agent is the cause of a particular disease, Koch's postulates indicate that the pathogen must be present in all cases of the disease. The postulates also indicate that the pathogen must be isolated from the diseased host and grown in pure culture.

As shown in our analyzed studies above, strong association between presence of ZIKV and development of microcephaly and GBS in humans exists.

However to conclusively demonstrate the cause-effect of ZIKV in microcephaly or GBS, more studies are needed as per Koch's postulates.

- First, the virus needs to be cultured in vitro. Fortunately, recent studies indicate that the virus can be grown in tissue culture cells.
- Second, the virus needs to be tested in animal models of microcephaly and GBS. Recent in vivo studies indicate the ZIKV can successfully infect immunocompromised mice.

These two in vitro and in vivo models will definitely help in the elucidation of ZIKV as the cause-effect of microcephaly or GBS or both.

UG-M14-Alaidroos2016

Breakfast Eating Habits among male High School Students in three Major Schools in Riyadh

Mohammed Abdulrahman Al-Gunaid, Zain Abdullah Ahmed Ba Fadhi, Zahran Ali Abobakar Baqashmer, Hussein Abdullah Hussein Alaidroos, Mohammed Omar Salem Al Ghurabi, Fares Saleh Bamajboor, Adam S. Ooad, Ahmed Hisham Sakah, Mohammed Abrar Shareef.

1- Background:

- Breakfast is considered an essential meal of the day
- Teenagers are highly susceptible to unhealthy lifestyle and irregular eating habits, which increases the risk for chronic diseases, metabolic syndromes, and obesity.
- On the contrary, having breakfast, as a part of a regular life-style, has been associated with positive academic outcomes and higher cognitive abilities.
- Many factors have been found to effect breakfast eating habits such as: sleeping time, family status, etc.
- A previous study among Saudis adolescents has found an association between sleep deprivation and skipping breakfast.

2- Significance and objectives:

- There are no previous studies from the region reporting adolescents' breakfast eating habits.
- The evidence remains equivocal that that breakfast enhances students' academic performance and cognitive abilities. Hence more studies are needed to confirm this hypothesis.
- The objectives of the study are to: report students' breakfast eating habits, determine some of the associated factors that influence it, and suggest some solutions.

3- Methods:

- Self-administered, anonymous Arabic questionnaire was distributed among three high schools in Riyadh.
- Apart from demographics, the questionnaire inquired about three domains: social, physical, and mental.
- Statistical analysis:
 - Validity: exploratory factor analysis (AMOS)
 - Reliability: Cronbach's α (SPSS)
 - Difference between groups: Mann Whitney U Test, or Kruskal Wallis Test.

4- Results:

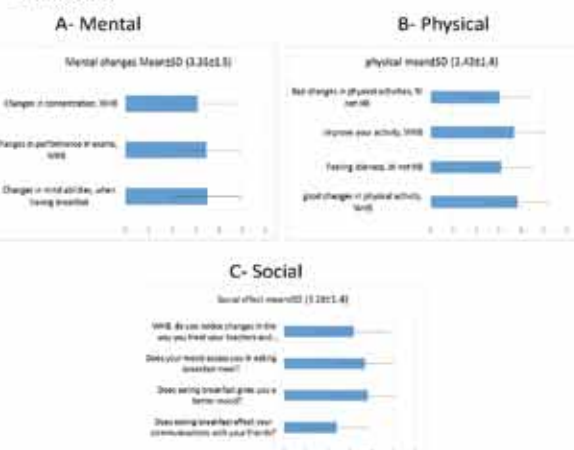
Demographics:

Demographics	Frequency n (%)
Academic year	
First year	246 (%27)
Second year	319 (%35)
Third year	298 (%32.7)
Total	863 (%94.6)
Age	Mean \pm SD 16.82 \pm 0.67
GPA	
A (95%-100%)	491 (%53.8)
A- (90% - 94.99%)	136 (%14.9)
B+ (85% - 89.99%)	84 (%9.2)
B below 85	116 (%12.7)
Total	827 (%90.7)
Mean \pm SD	93.01 \pm 12.94

Breakfast Eating Habits:

item	always	usually	sometimes	rarely	never	mean
do you eat breakfast	417 (45.7)	248 (27.2)	156 (17.1)	65 (7.1)	26 (2.9)	4.06
do you eat breakfast at home	204 (22.4)	161 (17.7)	201 (22)	185 (20.3)	160 (17.5)	3.07
do you eat breakfast outside	119 (13)	188 (20.6)	245 (26.9)	212 (23.2)	147 (16.1)	2.91
do you eat breakfast at school	330 (36.2)	224 (24.6)	169 (18.8)	109 (12)	79 (8.7)	3.67
does your family encourage you to have breakfast	473 (51.9)	142 (15.6)	131 (14.4)	82 (9)	84 (9.2)	3.92

Domains:



- Significant correlations: the results are reported collectively:
 - Students with high GPA have always had higher self-ratings of their mental status compared to lower GPA students ($P < 0.03$)
 - Students who have higher GPA reported to have break fast fast meals more consistently compared to low GPA students ($P < 0.01$)
 - Students who reported eating breakfast "usually or al ways" have reported higher scores in the three major domains.

5- Summary and conclusion:

In consistence with other studies, students who report healthy and regular breakfast eating habits, have a better academic and social outcomes. However, a considerable number of students have the habit of skipping breakfast on a regular basis. Efforts, therefore, need to be exerted to promote healthy lifestyle among high school students. Similarly, awareness must be raised among families about the importance of the breakfast meal. Nevertheless, more objective studies are needed to accurately assess the severity of the problem.

UG-M17-Glal 2016

Knowledge of First Aid Skills among Medical Students in KSA

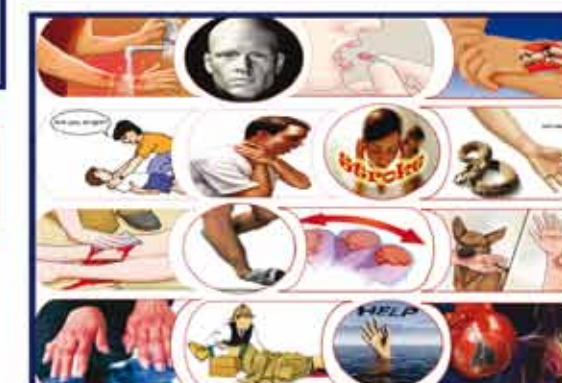
Mariam A. Glal, Najwa Samantha, Syed O. Imran, Mohammad S. Ahmad, Sarah M. A. Uddin, Santosh

Background

- Medical schools' curriculum neglects First Aid training
- Medical students' knowledge for handling an emergency without hospital setting at the site of the emergency may be inadequate.

Methods

Cross-sectional study was conducted among Alfaisal University medical students.



Aim of the Study

- Assess Medical Students' knowledge level in providing first aid care
- Identify the emergencies where the first aid knowledge is lacking
- Assess medical students' opinions regarding the need for first aid training at colleges

Results

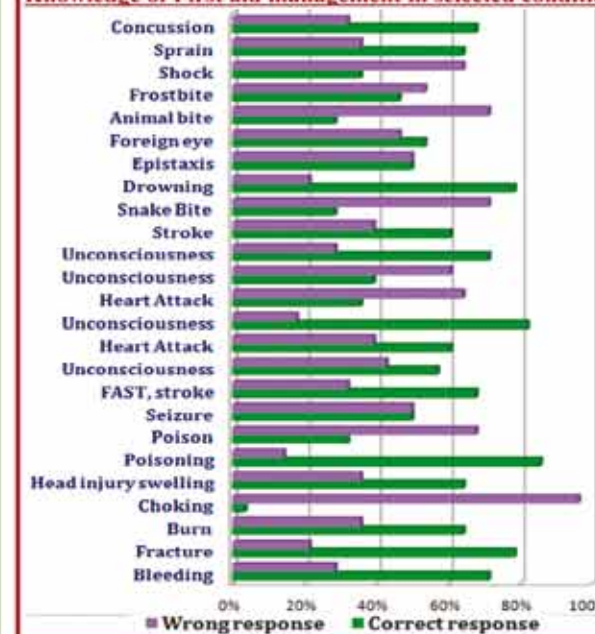
Females : 72% of the respondents



Based on the scores obtained in conditions requiring first aid, the overall knowledge was graded as good, moderate

Knowledge level Among Medical Students

Knowledge of First aid management in selected condition



Discussion

- Results suggested that the level of knowledge about first aid among the majority of students was **not good**.
- The study also identified the key areas in which first aid knowledge was lacking.

Conclusion

Absence of properly mandated first aid course is reflected in the students' not good knowledge; thus reinforcing the need to implement formal first aid training in the medical curriculum to strengthen knowledge-base.

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UG-M18-AIdeiry 2016
Category: Research: Medicine and Health Science

THE ULTIMATE PORTABLE CLASSROOM: THE ADVENT OF SCREENCASTING IN SAUDI ARABIA

MHD Amer Imad Aldeiry, Mohamad Owais Radwan Alzwadi, Susan Alideeb, Atheer Aljebery and Anikó Szabó

College of Medicine, Alfaisal University, Riyadh, Saudi Arabia

ABSTRACT

The digitalization of information has changed the methods of studying largely. Students do not read books any more, and this is a reality we must face. Many educational institutes have begun using various new technologies such as screencasting to enhance teaching and learning. These methods should be applied here in Saudi Arabia to facilitate the educational process.

Two purposes:

- 1- We wanted to move studying from a visual time consuming to an audio-visual time efficient.
- 2- Also, we wanted to investigate the effectiveness of using this method.

Two methods:

We decided to give the students the same study material in several different formats: Reading a book, reading a PowerPoint presentation, reading a summary table and watching a 5 minute screencast "home-made video" with narration. Then we asked them about their favorite learning method and the reason.

Results:

The overall feedback from the students showed that the screencasting method was their favorite method, it enhanced their learning process greatly especially by the animated pointer and pause-repeat features. They did not go to the classroom, the classroom came home with them.

1. Was the QTV history table screen casting your first time you used this method for studying at Alfaisal?



2. How many times a week do you study using QTV's functional learning mode?



3. How many times a week do you study using QTV's power point slides?



4. How many times a week do you study using the knowledge summary table?



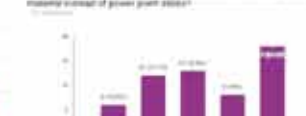
5. Do you think that the pause-repeat feature helped you to understand the material better?



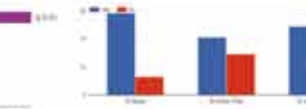
6. Do you remember better during exams after listening to screen casting lectures?



7. Have you watched the screen casting lectures?



8. Do you think that screen casting lecture should be used as a study material instead of power point slides?



SCREEN CASTING
from Visual to Audio Visual

Code: UG-M20-Abed 2016
Category: Research: Medicine and Health Science

Interactive and Portable Histology Teaching and Learning in an Integrated Curriculum

Abdulaziz Hussam Abed, Faisal Wael Al Kattan, Mi Rim Kim, Balsam Babiker Elgerray, MHD Amer Imad Aldeiry, and Anikó Szabó

Acknowledgement
Raphael Hill

Abstract

Background: Microscopy and Histology: "A challenging subject for many students".

Objectives: The effectiveness of a portable and interactive e-Learning environment was tested to see if it will simplify and facilitate histology teaching and learning.

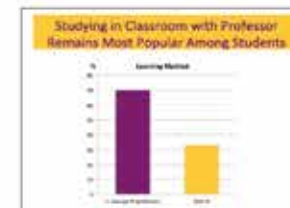
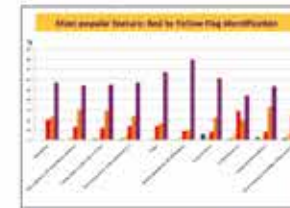
Methods:

1. Alfaisal University has installed Olympus VS120 Virtual Slide Microscope to aid in their histology education.
2. A survey questionnaire was administered to 100 students to obtain their feedback about Olympus VS120 Virtual Slide Microscopy.

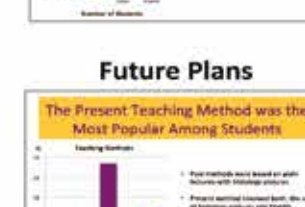
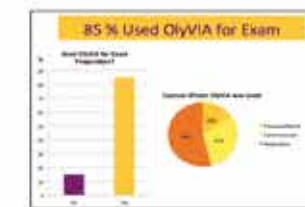
Results:

- The Olympus microscope and software are both fast and user friendly.
- These digital slides provided a portable and interactive platform for teaching and learning.
- It allowed students to study histology independently at anywhere and anytime.

Conclusion: The digital microscopy library provided a portable, interactive and self-directed learning platform for students. They were more motivated to learn and found histology learning faster.



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Effectiveness of short internet-based introduction to difficult concepts in undergraduate medical education

Rana Farahat; Maryam Tawfik Tawfik; Nada Alqadri Dalia Albagli; Santodh kumar
College of Medicine, Alfaisal University

Background: As a medical student, it is very normal to feel lost, overwhelmed, and confused during the lecture, specially a new concept lecture.

In this study we are trying to prevent these misconceptions by helping the students to prepare for the lecture. Studies have shown that coming prepared to the lecture could increase the retention of the information, save time, and improve the quality of learning

Objective: To study the effectiveness of short internet-based introduction to difficult concepts (pre-reading) in undergraduate medical education

Summary of Work :



1-Meet with the lecturers and ask for objectives and expectations, upon that an introduction would be conducted.

2-Provide medical students of first, second and third years with these internet-based introduction before the lecture

3-These introductions (and in some cases their online links) will be sent to students before the lectures

4-After applying, surveys would be distributed on students and faculties to be able to evaluate performance.

Summary of results:

We expect:

- 1-The lecturer to notice a change in the students' understanding, engagement, and concentration.
- 2-Coordination with the lecturer prior to the lecture is to avoid any confusion that would happen if we introduce new unnecessary information.
- 3-Increase retention of information

Conclusion:

We hope that giving a small introduction, refreshing previous knowledge or introducing new topics in a simplified way, will increase students' academic performance.

Research

UG-M22-Ahmad 2016

Undiagnosed ADHD at Alfaisal University

Mohammad Sharique Ahmad, Sarah Mortaja, Aman Alikishi, Syed Ahmad Neamatullah, Fatimah Alghamdi, Ahmed Yaqinuddin

Introduction: Attention Deficit Hyperactivity Disorder (ADHD) is known to last into adulthood in many cases. It is of utmost importance to help those who are undiagnosed with their chaotic lifestyles, impulsivity, inability to adapt, distractibility, inability to prioritize activities, impaired education and the psychiatric comorbidities that come with ADHD such as depression and anxiety.

Children: 5-7%

Adults: 3-4%

Objectives:

- 1) To find the number of students that fulfill the criteria of having ADHD though refuse to seek professional help and their reasons for this.
- 2) Interest in peer-oriented support programs for students with ADHD



Methodology: Students were handed questionnaires to identify ADHD symptoms and also to gauge their perceptions towards ADHD as a treatable disorder. Information on other medical conditions such as that may manifest through ADHD-like symptoms was accounted for. Internationally accepted criterion was implemented, with the "Adult Self-Report Scale-V1.1" being used in this study that has a five item likert scale with specific choices that are indicative of ADHD symptoms.

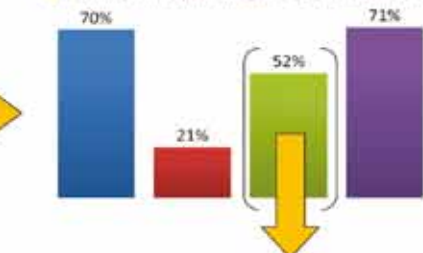
Adult Self-Report Scale-V1.1 (153 Students)

Don't Have ADHD Symptoms Have ADHD Symptoms (Undiagnosed) Have ADHD Symptoms (Diagnosed)

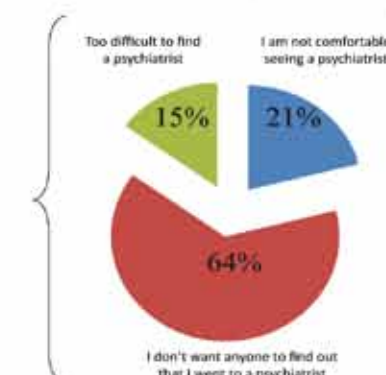


Of The 25% That Have ADHD Symptoms:

I am negatively affected I don't want to see a psychiatrist I rather hide having ADHD I would join a peer support group



**Lost Potential?
Professional Help?
Medication?
Support?**



Conclusion: Although ADHD is relatively accepted and understood in Saudi Arabia, even more so among medical students at Alfaisal University, the stigma attached to visiting a psychiatrist or seeking help is a huge hurdle. A large amount of students suffer from undiagnosed ADHD and could be helped if they seek a professional. It is the responsibility of not only the university, but health-care authorities to make access to psychiatrists easier and slowly but surely work towards removing the stigma associated with mental disorders

RESEARCH

UG-M23-Ahmad 2016

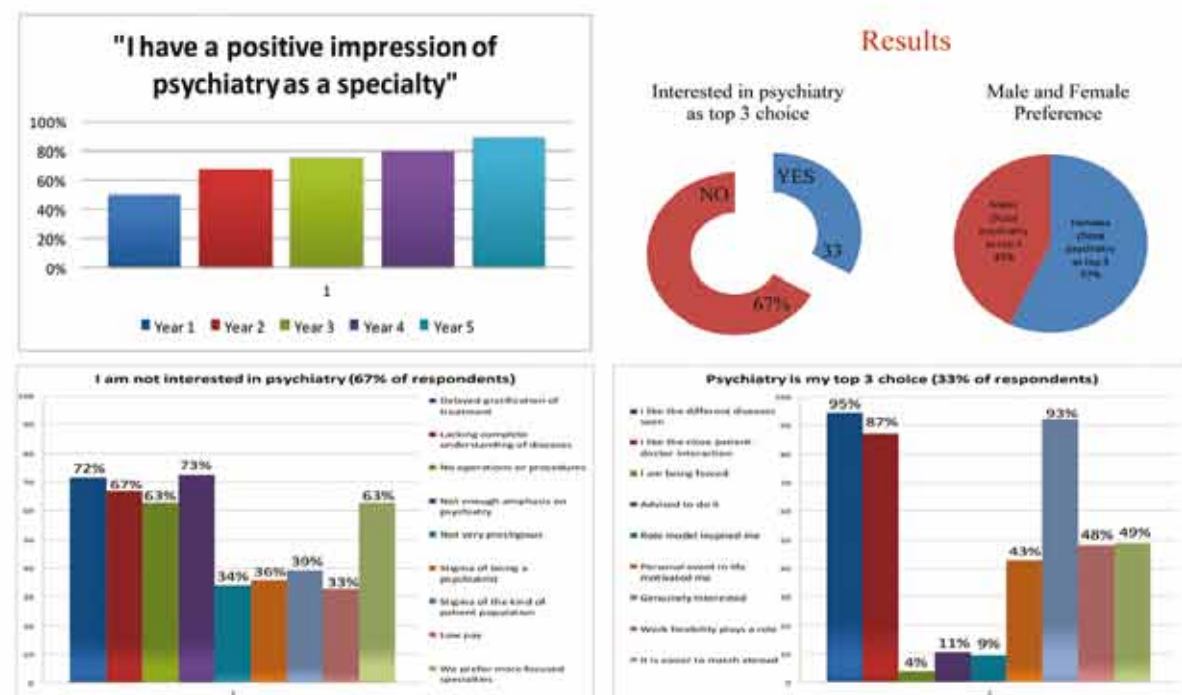
Medical Students Attitudes Towards Choosing Psychiatry As A Future Career

Mohammad Sharique Ahmad, M. Marwan Dabbagh, Abdulaziz Barakat, Alawwab Dabaliz, Samy Kaadan
College of Medicine, MBBS, Alfaisal University, Riyadh, Saudi Arabia

Introduction
There is an annual decline in new trainees in psychiatry in many parts of the world. This deficiency is projected to create gaps between mental health service needs and providers.

Objectives
Our aim is to study factors influencing attitudes of medical students, both positive and negative, towards psychiatry as a career.

Methodology
Many influencing factors were put forward to 153 students through surveys for selection, and their answers analyzed based on positive and negative responses towards choosing psychiatry as a career.



Conclusion
Our findings give an optimistic view towards the future of psychiatry in the region, given the large number of students (33%) who consider it in their top 3 choices.

The factors identified in our study to have a negative influence on students' attitude towards psychiatry should be tackled by medical schools and higher authorities, as this has shown to be of benefit in previous studies.

UG-M24- Ahmad2016

Factors Influencing Future Specialty Choices

Mohammad Sharique Ahmad, Ghada Alhayaza, Rakan Alsaad, Zeina Kayali, Mazen Almasry, Ahmed Yaqinuddin

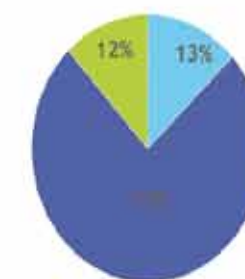
Background and Objective

With a diverse range of specialties available for medical students, choosing one should be a well-planned decision. In this study, we aim to identify the factors influencing their choices and how they differ between males and females.

Methods

A cross-sectional study of 223 medical students through a comprehensive questionnaire looked at the most frequent specialty choices among males and females, and the major factors that influence these choices.

Did you make a clear decision about your future specialty?



Results and Discussion

Females are much more likely to select pediatrics, obstetrics and gynecology. Whereas males lean more towards internal medicine. Interestingly, surgery was the top first choice for both genders. Quality of life and further options for sub-specialty choices dominated as reasons for choosing a specialty. Males considered high income to be a much more important factor than females, whereas easier matching options were more popular amongst females. Since many students at Alfaisal University are foreigners, they prefer to seek career options abroad. Thus, the rate of acceptance into residency abroad is an important factor. Another valued factor is keeping options open by choosing specialties that can further lead to several sub-specialty options such as Surgery and Internal Medicine. Salary and reputation do play a significant role in choice, but not as much as the literature shows from other parts of the world.



Conclusion

Compared to literature, the main factors for choosing a specialty remain almost the same at Alfaisal. Regional and cultural differences were found to be the leading factors influencing students' specialty choices among both genders.

UG-M25-Ahmad2016

Perception and Involvement of Medical Students in Extracurricular Activities

Mazen Almasry, Zeina Kayali, Rakan Alsaad, Ghada Alhayaza, Mohammad Sharique Ahmad, Ahmed Yaqinuddin

Background and Objectives

Extracurricular activities (EA) play a vital role in student development in all stages of their schooling years. With EA being part and parcel of the complete university experience, this study aims to analyze medical students' perception about being engaged in these activities. Furthermore, this study will find out whether there is a direct correlation between participating in extracurricular activities and the students' academic performance

Methods

Major factors that influence students to engage in or be deterred from participating in EA were collected through a questionnaire given to medical students of all years. Additionally, perception of involvement in EA and its effects on academic performance was evaluated.



Discussion and Conclusion

Our findings show that EA can actually boost academic performance in some students. The more time spent doing EA, the higher the likelihood of a negative academic impact. A significantly large amount of students at Alfaisal University engage in EA to boost their CV's and achieve high standing in the university, rather than for recreational desires. Many of those not involved in EA cite time restraints and academic work-load as their primary factors.

Take-home Message

A majority of students report no negative effects on academic performance when actively engaged in EA. Only those who are not involved in moderation see negative effects.

UG-M26-Mina2016
Research

Comparative Analysis of Parallel Problem Based Learning (PBL) and Team Based Learning (TBL)

Syeda A. Mina and Hala Hassanein

INTRODUCTION

Over the years, evolution of medical curriculum worldwide has introduced contemporary teaching techniques such as PBL (problem based learning) and TBL (team based learning), in addition to existing traditional lecture based learning to further enhance a student's learning experience. However, there is a deficiency throughout the literature to compare whether TBL or PBL is better suited mode of teaching for undergraduate medical students.

OBJECTIVES

- To comparatively assess several facets of both the PBL and TBL system to identify student's preferences in each domain
- Explore correlations between the students' preference towards either PBL or TBL and their English proficiency/ cGPA
***Hypothesis:**
Overall, medical students preferred PBL teaching system in comparison to TBL, especially low achieving students in terms of their cGPA.

METHODOLOGY

Setting and Participants:

Alfaisal University, CoM Year: 2014-15
Target population: 2nd year medical students for that corresponding year (n= 190)

Questionnaire:

Paper based survey was administered which included demographics and 29 likert scale statements which were later grouped into seven domains.

Data analysis:

- Paired t-test to assess the 7 domains between PBL and TBL
- Independent t-test to correlate PBL/TBL vs. cGPA and English proficiency

RESULTS

- Overall response rate: 78.9% (n=150/190), almost equal responses from males and females, 47% and 49%, respectively.
- Majority of students preferred PBL > TBL, but recommended to have both PBL and TBL systems administered simultaneously. Most students (84%) also prefer to have TBL sessions considered as mid-term examinations, though no correlation with their cGPA could be established.

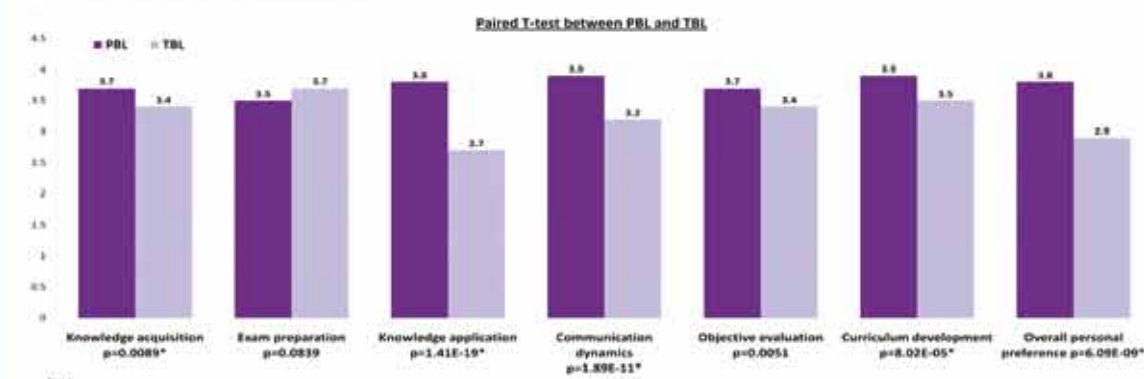


Fig 1

Number of students who preferred PBL vs. TBL:

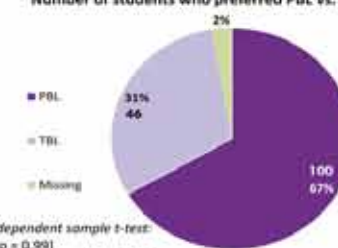


Fig 2. Independent sample t-test:
- cGPA [p = 0.99]
- English Proficiency, [p= 0.001*]
Students with poor English proficiency preferred TBL

CONCLUSION

In conclusion, PBL was generally more preferred over TBL in almost all domains except in terms of examinations. However, no significant difference could be established between high and low achieving students. Moreover, students with poor English proficiency preferred TBL > PBL.

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Research

UG-M27-Mortaja 2016

The Prevalence of Modifiable Risk Factors of Diabetes Mellitus Among Medical Students

Sarah Z. Mortaja, Fatimah A. Alghamdi, Aman A. Alkishi, Mohammad Sharique Ahmad, Syed Ahmed Neamatullah, Hamad H. Aldraye and Ahmed Yaqinuddin.

Background

Medical students are susceptible to developing unhealthy habits due to the demanding nature of medical school, such as sedentary lifestyle, lack of exercise, smoking and consuming junk food. Some of these unhealthy habits are considered to be risk factors for diabetes mellitus. Statistical data from the International Diabetes Federation in 2015 showed that there are 3.4 million cases of diabetes in adults in Saudi Arabia.

Objective

To assess the prevalence of modifiable risk factors of diabetes mellitus amongst Alfaisal medical students who are aware of the implications of the presence of these risk factors.

Methods

A cross-sectional study (sample size 300) through an electronic questionnaire was given to medical students and interns from Alfaisal University. They were asked for basic demographic data, and information about having risk factors of diabetes mellitus was obtained.

References

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4. Hart CL, Huk DJ, Lawlor DA, Davey SG. How many cases of type 2 diabetes mellitus are due to being overweight in middle age? Evidence from the Malmgren prospective cohort studies using mention of diabetes mellitus on hospital discharge or death records. *Diabet Med*.
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Results

Preliminary results were recorded from 104 respondents; 19 (18.27%) had a BMI > 29.9. Only 1 participant with a BMI > 29.9 subjectively reported being a body builder. Leading a sedentary lifestyle was reported by 31 (29.8%), and 33 (31.8%) said they have an active lifestyle with at least 60 minutes of moderate activity daily. Only 3 (2.9%) were smokers, but 30 (28.8%) claimed that they are frequently exposed to second-hand smoking.

Discussion

Sedentary lifestyle and a BMI of > 29.9, which indicates obesity, are great risk factors for developing type 2 DM, and were found in a relatively high percentage of the participants. Furthermore, smoking and frequent exposure to cigarette smoke could increase the risk of developing chronic disease.

Conclusion and Take Home Message

Modifiable risk factors of DM are prevalent among medical students. Medical students and interns are the future health care providers. Modifying the various risk factors could be the first step to a healthier society, and could potentially decrease the prevalence of diabetes mellitus.

Code: UG-M28-Dabaliz2016
Category: Research

AN INSIGHT INTO THE NATIONAL MEDICAL ADMISSION PARAMETERS AND PREDICTABILITY OF OUTCOME: WHERE DO WE STAND?

Al-Awwab Dabaliz*, Abdulaziz Barakat, Samy Koodan, M. Marwan Dabbagh, Ayman Mohamed, Akef Obeldat

Background

The increasing number of outstanding medical school applicants has led to the development of several pre-admission assessment tools that cover the different areas of academic achievement, non-academic competencies and language proficiency. The majority of these tools, however, have questionable predictive value.

In this study, we evaluate the predictive value of the Saudi national admission parameters (AP) on medical students' performance.

Advantages:

Using the progress test (PT) in addition to the cGPA to evaluate the predictive value of AP. Investigating the predictive value of cGPA on PT.

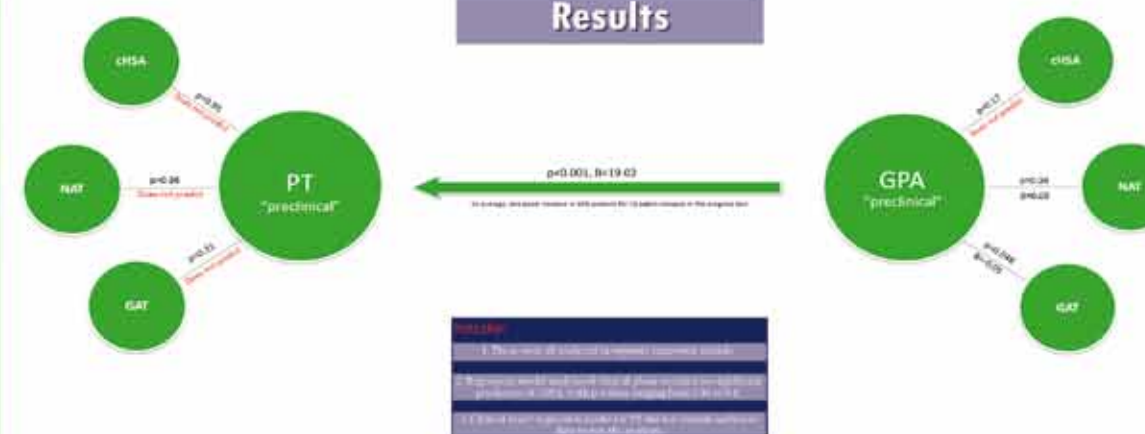
Data Extraction

- n=737
- 55.5% males
- years 1-6

Data Analysis

- Multivariate regression analysis
- Outcomes predicted?

Results



Take home message:

Reassess the effectiveness of AP by investigating each one's predictive value. They should not be taken for granted as is. Utilizing the PT in evaluating the performance predictive value of widely used admission parameters should be considered. Developing sensitive admission parameters that predict student performance, especially in clinical years, is an urgent need.

Admission Parameters:

CHSA: cumulative high school average, NAT: national achievement test, GAT: general aptitude test

Limitations:

- The study represents data from only one school in Saudi Arabia, thus further studies using data from multiple schools are needed to enhance the reliability of these findings.
- Data available was not sufficient to evaluate the predictability of admission parameters on PT in clinical years, however, as more students progress into the clinical years, we will be able to evaluate its predictability.

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Innovation
UG-M29-Dabbagh2016

"Framework of Unified Learning Outcomes - (FULO)" and the INTERNATIONAL PROGRESS TEST - (IPT)

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College of Medicine, MBBS, Alfaissal University, Riyadh, Saudi Arabia

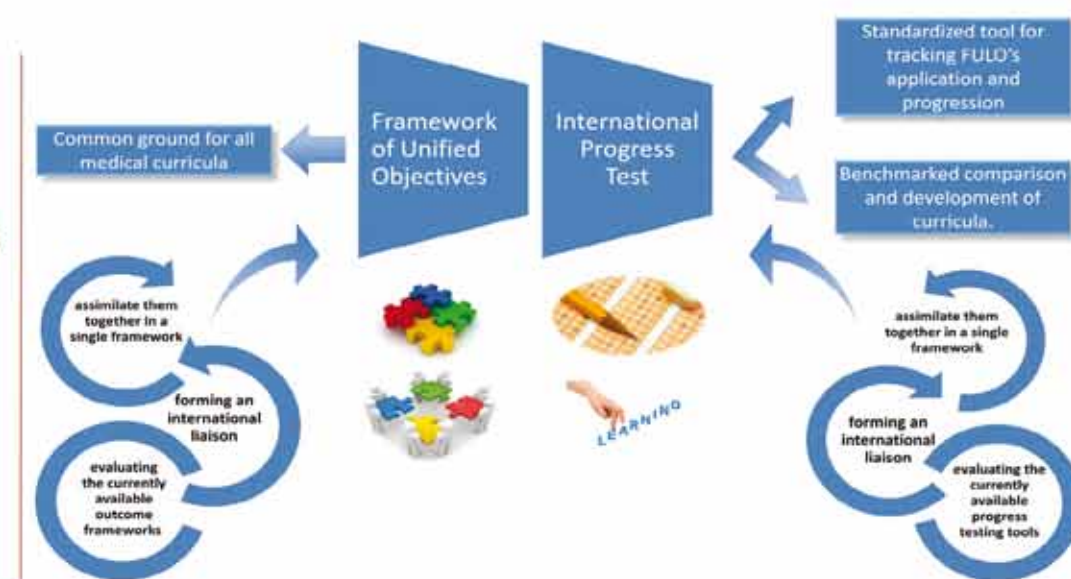
Introduction

Medical colleges around the world follow different medical curricula. Theoretically, all the systems should share similar learning outcomes intended to be acquired by their graduates; however, practically speaking, each medical school has its own learning outcomes despite the simple fact that all graduates must ideally be equipped with more or less the same core knowledge and basic skills.

Objective

There is a need for a unified collaboration between the medical curricula in regards to curriculum development and progress follow up. In an attempt to deal with this issue, we propose the following model:

Methodology



Potential Benefits

- Unified learning outcomes ensures standardization of education and hence quality of care in the long run.
- FULO would allow weaker schools to revive and develop.
- Transferring courses and students between colleges would be much less burdensome for the student and administration.
- IPT would allow for greater educational efficiency in curriculum development and progress assessment
- Additional perks like
 - reduced overall cost burden on medical education since production and administration of the test would be a collaborative process.



UG-M30-Alghamdi 2016Research

Comparing PBL TBL And CPC Outcomes In Medical Schools: A Students Perspective

Fatimah Abdullah.S Alghamdi , Mohammad Sharique Ahmad, Sarah Mortaja, Aman Abdullah H Al Kishi, Syed Ahmed Neamatullah Ahmed Yaqinuddin

Background

A few studies in the last decade in the medical education field have been exploring pedagogy and its impact on learning outcomes, which is measured by examination and continuous assessment. Educators considering implementing problem-based learning (PBL), team-based learning (TBL) and clinic pathological conference (CPC), need evidence of its effectiveness, and more studies and recommendations

Aim

Our main objective of this study is to compare the main strengths of PBL, TBL, and CPC as perceived by medical students and factoring in positive or negative reaction, learning outcomes and behavior.

Summary of work

Our study population is third year medical students who have been exposed to all the three strategies at Alfaissal University, Riyadh, Saudi Arabia. The data was obtained by an online survey

Summary of Result

Our preliminary results showed that 70.2% of students agree that TBL allowed them to improve their understanding of medical concepts. 81.1% of respondents agreed that PBL improved their thinking process, including problem solving abilities. 79.1% of students said that having a subject specialist teach during CPC sessions was highly beneficial.

Discussion

This brief survey highlights the importance of TBL for medical students in building their medical knowledge. We can also appreciate the role of PBL towards developing important skills like problem solving strategies and creating a systematic clinical approach. Students also like CPC sessions, as long as an expert in the field is providing the session.

Conclusion

A large number of students at Alfaissal University depend on TBL and CPC as source to retrieve their medical knowledge, and PBL as a strategic teaching session to approach medical cases systematically.

Take home message

In medical schools, different teaching strategies should be applied, with regular frequent feedback. There is no one particular strategy that is better than the other. All have their own benefits.



TBL: allowed me to correct my mistakes and improved my understanding of concepts.



PBL: I have found that being part of a team has improved my thinking process, including my problem solving abilities



CPC: The presence of the subject specialist and his involvement in discussions was valuable and helpful



An Innovation in Peer-To-Peer Mentorship: Mentoring Mentors-To-Be



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College of Medicine, MBBS, Alfaisal University, Riyadh, Saudi Arabia

Background

Many colleges often give academia and assessment the superior-most attention; they often disregard the human part of students in the process by underestimating the role of counseling and mentorship. In fact, most colleges in the Middle-East lack a proper mentorship program and some do not even possess one.

Issue

Several mentorship programs fail to achieve their goal and are either dormant or ineffective. Most studies blame it upon undertrained counselors and disregard a very possible cofactor, which is the lack of interest/obedience from students themselves; i.e. students who are 'resistant' to mentorship. We developed an idea to overcome this phenomenon.

Idea?

Mentoring mentees to become future mentors.



Hypothesis



How?



Goals



EVALUATING THE PREDICTIVE VALUE OF ENGLISH PROFICIENCY ON STUDENT PERFORMANCE IN MEDICAL SCHOOL

Samy Kaadan, M. Marwan Dabbagh, Abdulaziz Barakat, Al-Awwab Dabaliz,
Ayman Mohamed, Akef Obeidat
College of Medicine, Alfaisal University, Kingdom of Saudi Arabia

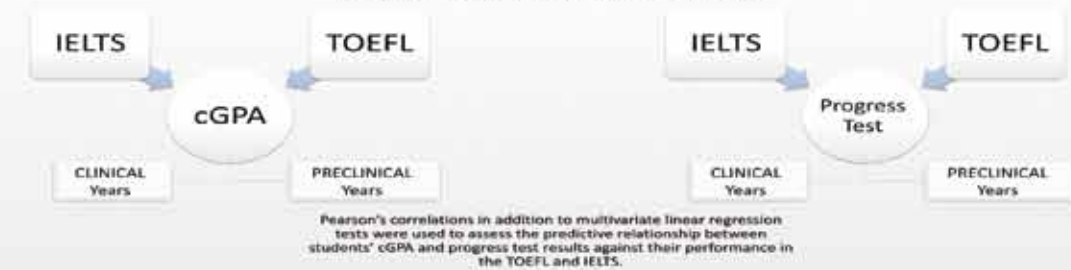
Introduction

Most educational acts are primarily exchanged through human language; be it dialogue or text. Hence, adequate proficiency in the specific language of instruction at any college of any major should logically be one of the most fundamental prerequisites for admission. For that purpose, several standardized English proficiency assessment tests were devised and later recognized internationally by thousands of institutes worldwide. There is no sufficient literature correlating TOEFL and/or IELTS to important student performance indicators such as GPA and PT.



Methods

We carried out this study in the college of Medicine at Alfaisal University. Data was gathered from databases of six batches of students



Results

Our results found the TOEFL scores to be predictive of cGPA in preclinical years ($p < 0.001$); however, this was not observed in clinical years.

On the other hand, IELTS was not found to be predictive of performance in neither preclinical nor clinical years.

TOEFL was a positive predictor of the national Progress Test (PT) scores in all years of medical college ($p < 0.001$), unlike the IELTS.

Conclusion

Several studies have shown English proficiency to be a significant indicator of student performance; however, despite the reported predictability of TOEFL on PBL performance and the wide application of both TOEFL and IELTS exams in the medical admission process, it is surprising that there is no sufficient literature correlating TOEFL and/or IELTS to important student performance indicators such as GPA and PT.

- We report that TOEFL was found to be a significant predictor of student performance in medical school reflected by its strong correlation with cGPA and PT scores.
- We suggest devising a new standardized English proficiency assessment tool, tailored to better fit and correlate with medical school progression outcomes.

Dietary Habits among Medical Students: are we in trouble?

Aman A. Alkishi, Sarah Z. Mortaja, Mohammad Sharique Ahmed, Fatimah A. Alghamdi, Syed Ahmed Neamatullah and Ahmed Yaqinuddin.

Background:

Nutritional value of the diet and its contents is an essential component of a person's physical and mental welfare. This study examines 1) the relationship between dietary habits and medical student performance, 2) the relationship of consuming the breakfast early in the morning with their performance in the class during the early morning lectures, and 3) the nutritional value of the food consumed by the medical students.

Hypothesis:

Wrong dietary habits and nutritional states are ones of the main factors that can severely affect a medical student's performance.

Methodology:

- Preliminary: 41 students were surveyed.
- Age groups included students that are 17-25 years of old.
- Data was collected via an online self-administered questionnaire.

Results:

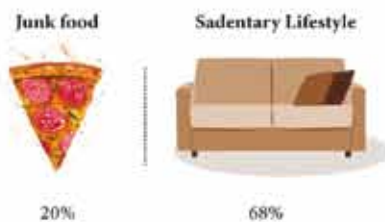


Figure 1. Health-compromising behaviors: both of which indicated a decrease in academic performance.

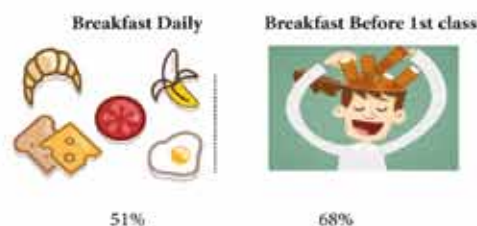


Figure 2. Health-enhancing behaviors: breakfast is the most important meal of the day.

Conclusion:

This study suggests that medical students with sedentary lifestyle along with poor dietary habits do have a negative impact on their studies.

Take Home Message:

College administrations should address the breakfast issue along with the importance of the consumption of rich nutritional value food and an active lifestyle, particularly for medical students, who should play a role in public health advocates.

References:
1. Alkishi A, Mortaja SZ, Sharique M, Ahmed F, Alghamdi FA, Neamatullah SA, Yaqinuddin A. (2016) Dietary Habits among Medical Students: are we in trouble? *Alfaissal University Journal*. 2016; 2(1): 1-10.
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The Propensity of Medical Students to Pursue Family Medicine: Is Primary Health Care at Risk?

Abdulaziz Barakat, M. Marwan Dabbagh, Mohammed Sharique, Bilal Alhilo, Ahmed Hamed, Ibrahim Almulla, Baraa Ghalayini
College of Medicine, Alfaisal University, Riyadh, Saudi Arabia

Introduction

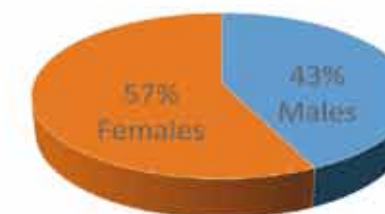
Family medicine (FM) is a rare medical specialty in the Middle East, where unfortunately, primary health care physicians' role is underestimated. The number of medical students choosing family medicine as a career has steadily declined worldwide in the past 10 years.

Methodology

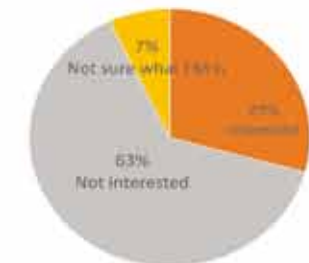
This is a cross-sectional study, 1st to 4th year medical students were surveyed at Alfaisal University (AU), Riyadh, KSA. Survey included questions regarding how interested are the students in pursuing FM as a future specialty. Students rank-ordered their choices and provided reasons as to why/why-not choose FM.

Results

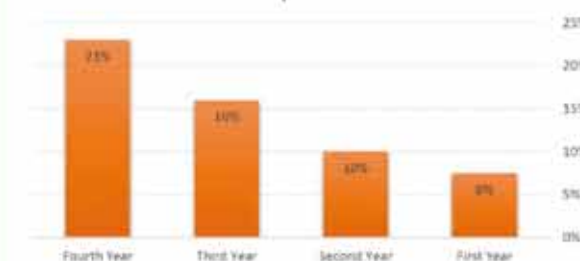
Family Medicine Specialty as top 3 Choice
Male vs. Female



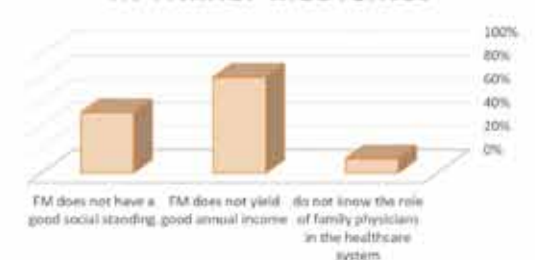
What do you think about Family Medicine as a future specialty?



The interest of Family Medicine specialty as top 3 choice



WHY ARE YOU NOT INTERESTED IN FAMILY MEDICINE?



Discussion & Conclusion

In comparison with similar studies, in which they have an interest rate of 20% as top specialty and 50% among the top 3, the interest in FM in AU is much lower. However, our findings supports the literature in which the experience increases the interest in selecting FM. Education plays a pivotal role in students' perception towards underestimated yet very crucial specialties like FM. It is our duty as educationalists to make sure that the curricula are designed in a way that sheds adequate light on the important role of family physicians within the healthcare system.

Research
UG-M35-Alkhatib 2016

The Impact of Social Media on Academic Performance – A Medical College Perspective

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Introduction

University students constitute the majority of social media users nowadays. Medically speaking, research studies reported that social networking provides a good platform for medical professions and students to connect with each other, disseminate the knowledge and increase the awareness about newly evolving issues in the healthcare sector. However, social media can be described as a double-edged sword as it can be used efficiently in learning, as well as time wasting. Few studies have been conducted on the perspective of students using social media, in which the students reported that social media has an impact on academic performance, however with varying positive and negative effects. The literature lacks quantitative analysis to evaluate the effect of using social media on academic performance.

Methodology

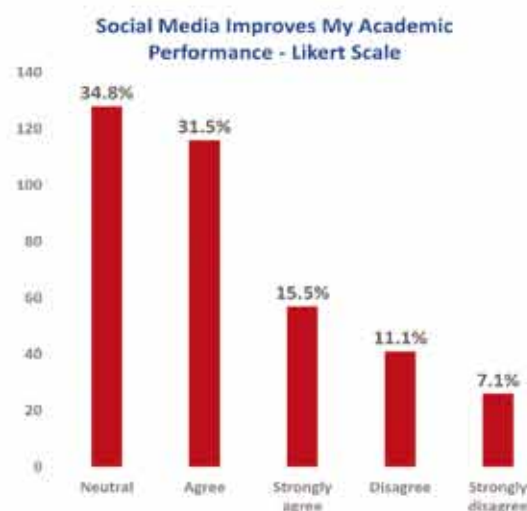
This is a cross-sectional study. A questionnaire was distributed among medical students from year 1 to 3 in Alfaisal University. The aim is to correlate the use of Social Media with GPA as an academic performance indicator.

Results

368 respondents participated. A **positive correlation** was found between GPA and number of times social media is checked ($r=0.164$, $p=0.002$), as well as a **positive correlation** between GPA and no. of hours spent on social media ($r=0.124$, $p=0.017$) was found. A negative correlation was found between hours spent on social media and medical education purposes. ($r=-0.125$, $p=0.016$). Lastly, 31.5% **agreed** and 15.5% **strongly agreed** that Social Media improves their academic performance (3.37 ± 1.092).

Conclusion

Social media has a positive effect on the academic performance of medical students at Alfaisal University, as the number of hours spent on social media, and number of times social media is checked, has a positive correlation with GPA. In addition, the results show that the use of social networking has a positive effect on their academic performance. **Therefore, there should be more utilization and integration of social media into educational processes.**



Research
UG-M36-Barakat2016

The Use of Social Media in Medical Education: Lessons for the future

Abdulaziz Barakat, Lin Tuleimat, Lynn Alkhatib, Fareeha Abdulwali, Mohammad Shareef
College of Medicine, Alfaisal University, Riyadh, Saudi Arabia

Introduction

Over the past few years, the use of social media (SM) has increased drastically in various aspects. Especially with respect to education. However, few studies were conducted to assess the use of SM by medical students.

Methodology

This is a cross sectional study. An electronic questionnaire was distributed among medical students from year 1 to 3 in Alfaisal University. Around 368 responses were collected. We sought to identify the most common SM sites used by medical students and their preference of using them.

Results

368 respondents participated in the study. The most common 3 social media sites used by medical students are WhatsApp, YouTube and then Facebook respectively. Among males, 86.6% found Facebook as the most beneficial website for MCQs. Furthermore, 77% of 2nd year and 75% of 3rd years used social media for notes. It was also found that the use of social media for questions differed by GPA, $X^2(3, n = 368) = 8.982$, $p=0.030$. Among those with GPA of 3.5- 4.0, 49.1% used social media for questions. Around 85% of males found Facebook is useful in sharing notes and questions while 75% of females found it not useful. Furthermore, the results exhibited Social media facilitation of the communication with colleagues about learning issues effectively (24.5%).

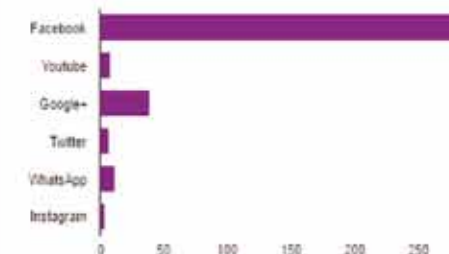


Figure 1. MC used social media for practice questions

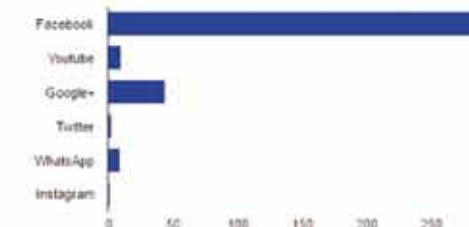


Figure 2. MC used social media for summaries and notes

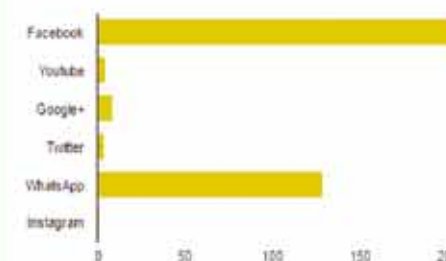


Figure 3. MC used social media for discussions

Social Media	Mean \pm SD	Median
WhatsApp	2.64 \pm 1.86	2
Facebook	3.08 \pm 1.74	3
YouTube	2.88 \pm 1.59	3

Discussion and conclusion

Our findings show that social media plays a pivotal role in the lives of the students as the use of social networking affects them academically in a positive manner, where it can be used in various aspects. This includes, but not limited to, sharing summaries and notes, discussing with colleagues about their assignments, solving questions and watching tutorial videos. Yet, the academic use of Social media remains an emerging field, which needs further attention from the educators for innovation and better utilization in medical education.

Computer vs Paper Based Exam in Alfaisal University College of Medicine

Mays Altahhan; Heba Musallam; Aisha Alharbi; Akef Obeidat; Santosh Kumar
College of Medicine, Alfaisal University

Background

- The age of technology has vastly grown, however, its use in medical education, especially in assessment, has been slow particularly in developing countries.
- At Alfaisal University College of Medicine, computer-based exam (CBE) is being introduced and will gradually replace the paper-based exam (PBE).



Methodology

- Cross-sectional survey-based study
- Conducted via an online survey with both quantitative and qualitative components.

The aim of this study is to seek students' feedback and understand their perception on CBE vs PBE at this critical transition phase.

Results

- Preliminary results indicate that majority of students favor CBE over PBE.
- Main reasons cited include user-friendliness of CBE, less time consuming during the exam, less time to grading, and less chances of error in CBE compared to PBE.

Discussion

- CBE is more acceptable in students as the new generation is tech-savvy and more comfortable with its use.
- Students also consider it an opportunity to prepare for future international exams which are computer-based.
- One of the comments indicated that CBE saves paper and avoids hassle with scantrons.

Conclusion

- It is right time for transition to paperless CBE as it is user/student-friendly, efficient and environment friendly.

M38-SARKAR
Entrepreneurship

: Mobile Health Service



Shefa'

... same world, better healthcare.

Features

1. Identifying hospitals/physicians available to you
 2. Locating the proper doctor, adequate to your concerns
 3. Booking and changing an appointment without hassle
 4. Being aware of health recommendations specific to you
 5. Having personal medical data always available
 6. Recording health patterns
- ...All aspects of health related services



Mobile App Solution

One-stop mobile application: **Shifa'**

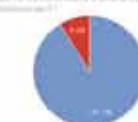
- Providing the first mobile app in the Arab region to offer users with new generation health care services
- First mobile app, worldwide, to provide complete health services in Arabic
- Carefully organized and bi-lingual for a user-friendly interface
- Security and privacy of user information
- Starting with essentials, such as locating the appropriate physician and rating physician and hospital services, to new generation health options, such as on-app medical consultations

Market Research

- 1200+ respondents
- 44.4% of respondents visited a physician in the past month
- >50% reported average or below average satisfaction levels with current hospital appointment booking methods
- Only 2% used an online portal (website) for health service
- >90% answered "Yes" when asked if they would use an app that provided them with medical services such as booking appointments
- 40% claimed they would be willing to pay for such an app

Business Model

- "In-App Advertising" will be our initial method of business
 - We want our community to have the chance to experience Shifa' before having to decide any commitments
 - Greater app exposure
- Fees from partners
 - We will contract clinics and hospitals who will use our app to connect to our clients (appointment booking, patient satisfaction, etc.)
 - High revenue source
- Lean Startup model



Support Team— Specialists

- Videographer/Digital Designer
 - Husein Alqadiri
- Finance
 - Ibrahim Alomar
- Marketing
 - Husein Alqadiri
- Quality Management
 - Kadija Gergan
- Information Technology
 - Radeen Al
- Mobile App Development
 - Faisal Alshaykh
- Special Team Advisor
 - Nora Aludairy

M39-SARKAR
Innovation-Community

YOMNA SOCIETY

Who?

Yomna Society is the first independent research and community development group in Saudi Arabia, that focuses on studying and working with the local population



What?

The study includes topics from socio-cultural beliefs, community behaviors, personal interests, as well as belief systems. Scientific methodology, accuracy, and analysis of all results

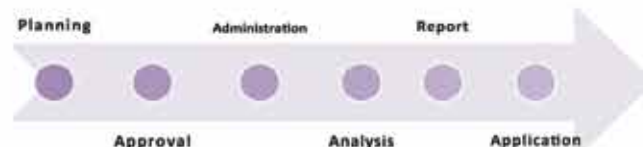
Why?

With such valuable information, every individual in the young and growing society of Saudi Arabia can have a better chance at growth and development

- Awareness
- Workshops
- Support

Facts

Population:
27,752,316*
46% <24 years*
Literacy: 94%*
Obesity: 33.7%*
Divorce: 2:5**



Partnerships

Medical Consultants
Behaviorists/Psychiatrists
Pediatrics
Statisticians
Coaches
Public Facilities
Educational Institutions



Validating the WHOQOL-BREF Questionnaire on Yemeni Medical Students and Assessing Their Quality of Life

ID:UO-M40-Ba Abbad2016

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Mohammed O. Al-Gharabi⁵, Fawziah R. Alshahr⁶, Adnan S. Chah⁷, Mohammed A. Shureef⁸
¹College of Medicine, Alfaisal University, Riyadh, Saudi Arabia
²St. Vincent Mercy Medical Center, 2213 Cherry Street, Toledo, OH 43606-2081, USA

Introduction:

- * The World Health Organization Quality of Life (WHOQOL) project, initiated in 1991, aims to develop an international cross-culturally comparable quality of life assessment instrument.
- * WHOQOL-BREF instrument comprises 26 items, which measure the following broad domains: physical health, psychological health, social relationships, and environment to assess the subjective quality of life (QOL).
- * WHOQOL-BREF has been translated and extensively validated in several languages.

Aim:

- * Validating (WHOQOL-BREF) questionnaire administered to Yemeni medical students and assess their quality of life.

Method:

- * An Arabic version of the WHOQOL-BREF questionnaire was administered to medical students of Hadramout University College of Medicine (HUCOM), Yemen.
- * Confirmatory factors analysis and Cronbach's alpha were used to assess the validity and reliability of the questionnaire, using AMOS statistical software and SPSS Version 20 respectively.

Results:

- * A total of 416 responds were retrieved and subjected to analysis. 56.5% of the respondents were males (n=235), and 43.5% were females (n=181). The study involved medical students from all academic years (years 1 through 6) with the majority being from year 2 (19%, n=79) and year 3 (18.5%, n=77).
- * The overall scores of physical health, psychological health, social relationships and environment domains were 13.51, 14.287, 14.65 and 12.31 respectively
- * The questionnaire showed good validity with the least loading factor value of 0.369 when four-factor priori model is adopted.
- * The instrument has shown an excellent internal consistency (Cronbach's α 0.891).
- * The mean scores were relatively low in all domains, especially among female students (scores <14.6, P values <0.02).

Validity:

The results of the analysis are reported below:

- * CMIN/Df: 2.743
- * Root Mean Square Residual (RMR): 0.061
- * Non-normed Fit Index (NNFI) or Tucker-Lewis index (TLI): 0.864
- * Comparative Fit Index (CFI): 0.896
- * Goodness-of-Fit Index (GFI): 0.910
- * Root Mean Square Error of Approximation (RMSEA): 0.065

Reliability:

The mean Cronbach's α coefficient is 0.891 which is indicative of excellent internal consistency.

Domain	Factor	Loading factor	Domain	Cronbach Alpha
Physical Health	F.18: Work Capacity	0.664	Physical Health	0.756
	F.17: Activities of daily living	0.732		
	F.16: Sleep and rest	0.479		
	F.15: Mobility	0.504		
	F.10: Energy	0.658		
Psychological Health	F.26: Negative Feelings	0.369	Psychological Health	0.751
	F.19: Self Satisfaction	0.731		
	F.11: Bodily Image and appearance	0.576		
	F.7: Ability to concentrate	0.527		
	F.6: Personal Beliefs	0.624		
Social Relationships	F.5: Life Enjoyment	0.611	Social Relationships	0.560 (low)
	F.22: Social support	0.516		
	F.20: Personal relationships	0.754		
	F.25: Transport Facilities	0.415		
	F.24: Accessibility of health care	0.503		
Environment	F.23: Home environment	0.497	Environment	0.769
	F.14: Leisure activities	0.521		
	F.13: Opportunities for acquiring new information	0.585		
	F.12: Financial Resources	0.490		
	F.9: Physical Environment	0.503		
	F.8: Physical Safety	0.540		

Conclusion:

The study detected an overall low quality of life among medical students in Hadramout, which was possibly exacerbated by the current political conflict in the region. National and international support, therefore, is required to implement solution to improve students' quality of life.

Acknowledgements:

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¹College of Medicine, Hadramout University, Mukalla, Yemen

UG-M41-Neamatullah2016

Secondary Education: A Reliable Predictor of Early Medical School Performance?

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INTRODUCTION:

Medical schools are among the toughest schools to get into due to rigorous competition. Accordingly, it is essential to have excelled during secondary education. With various curricula such as the American SATs, Saudi system, International Baccalaureate and the British system, not all students receive the same type of secondary education. Alfaisal University in Riyadh, KSA is unique in that it accepts students from various high school systems as part of its admissions criteria.

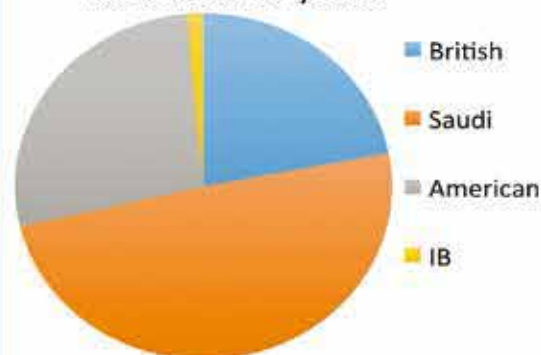
OBJECTIVES:

Determine what elements during secondary education schooling affect academic performance during the first two years of medical school.

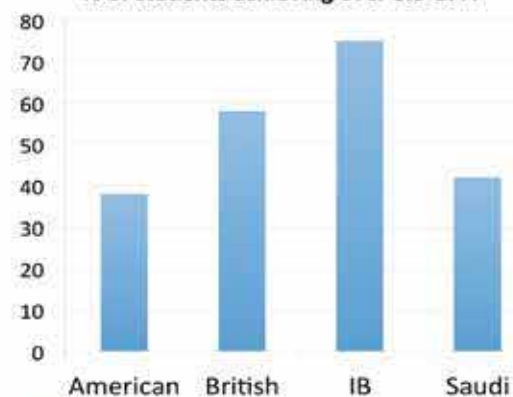
METHODOLOGY:

A questionnaire was distributed among the first and second year medical students at Alfaisal University enquiring students about their high school curriculum, high school GPA, and the standardized examination tests for admission into medical school.

Student population % coming from different school systems



% of students achieving over 3.5 GPA



CONCLUSION:

Students entering medical school from different curricula have varying degrees of academic success during the first two years. American and Saudi high school GPA and test scores did not correlate with medical school GPA while British system scores did.

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Headache among Medical Students: Prevalence & Impact on Academic Performance

Sarah M. Aftab Uddin; Mariam A. Glal; Najwa Samantha; Syed O. Imran; Mohammad S. Ahmad; Santosh Kumar; College of Medicine, Alfaisal University.

Background:

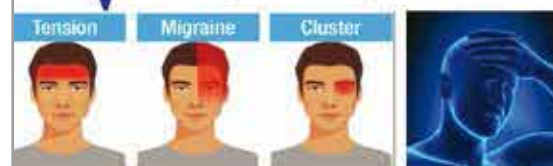
Headache is one of the commonest complaint among medical students. Frequently experienced health issue, yet downgraded by most. Migraine headache was suggested in 27.9% medical students at Kuwait University. Another study showed presence of Tension Headache in 58% of medical students at Taibah University, KSA. However, no evidence has been established on the prevalence of primary headache among medical student in KSA

AIM

- Assess the prevalence of headache among medical students in KSA
- Correlation of headache and academic performance

Methods:

It is a cross-sectional study, conducted via a self-administered online anonymous survey among Alfaisal University's all medical students.



Site, Characteristics, Signs and Symptoms

Onset, Duration



Academic Performance, Absentees



Managements taken by the students

Results:

EXPECTED RESULTS



We expect to quantify prevalence of headache and proportions of its types. The data will elucidate different etiological, triggering and relieving factors of headache among this population. We will also be able to assess if students perceive that headache affects their academic as well as social life.



Discussion:

The results will help us to develop better understanding of prevalence of headache, its etiologies, triggering and relieving factors, and its self-perceived impact on academic performance and social life among this population. Careful monitoring of these factors could be an important step to identify related medical issues among the students. The expected results may lead to the steps in treatment that may lessen the frequency and severity of headache attacks.

Conclusion:

Better understanding of these issues will guide better interventions, including awareness campaigns, so as to avoid any negative effects on students' health, academic performance and social life.

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An Assessment of Communication & Transferring Data Verbally Between the Paramedics & Receiving Facility (Physicians & Nurses) in Trauma Patients at a Level I Trauma Center

Authors: Abdulaziz Alali, MD, Abdulrahman Binaqail, Ahmad Albraikan, P. Engels, MD, Welsford, MD

Alfaisal University- King Fahad Specialist Hospital and Research Center- McMaster University

7th Annual Research & Scientific Day-Student Poster Competition

Poster Code :UG-M44-Binaqail 2016

Introduction

Patient handovers from ambulance crew to emergency department (ED) staff occur on a large scale every day in both acute and non-acute patients. Both Paramedical care and the Emergency workers are humans. And the normal nature of human-to-human exchange is susceptible to errors. Unfortunately, miscommunication or lack of information due to different protocols can have enormous ramifications on patient's health in specific and on the economy in general. "Communication errors are costly, both in human and economic cost".

Study undertaken to identify whether information was retained following verbal handover in the trauma setting found that only 34% of information verbalized by paramedics was recalled by receiving physicians for patients who had suffered severe trauma.

These errors are results of many factors and events that can distract either the proper delivering or receiving very important case facts. Some of the distracting factors include (stress, lack of time, loud noises, omitting underestimated facts, flowing different protocols, or simply forgetfulness!), which raises the necessity to create a unified protocol that includes all the valuable information about the patient, the paper came to highlight one of these factors, that is, the usage of different protocols among the health care providers.

Development of standard procedures for communication in patient handovers is one of the World Health Organization's top five priorities within patient safety in developed countries.

Our aim is to first, determine the opinions of paramedics and receiving facility regarding the components of a standardized report for trauma handover. Second, to identify the knowledge gaps of trauma handover between the paramedic & receiving facility. And third, to develop a standardized communication tool for use between the paramedics & receiving facility in trauma patients.

Methods

This will be a prospective descriptive study, gathered from both interview and an online survey tool. The survey was distributed electronically through the SurveyMonkey.com website to all trauma team leader staff physician, trauma fellows, emergency medicine staff physician, emergency nurses & paramedics, from a single level-one trauma center from March 1st, 2015 to Jan 30th, 2015. Survey response will be encouraged through electronic reminders and in person interviews to assist with on-line completion of the survey tool.

Discussion

Is standardised handover needed?

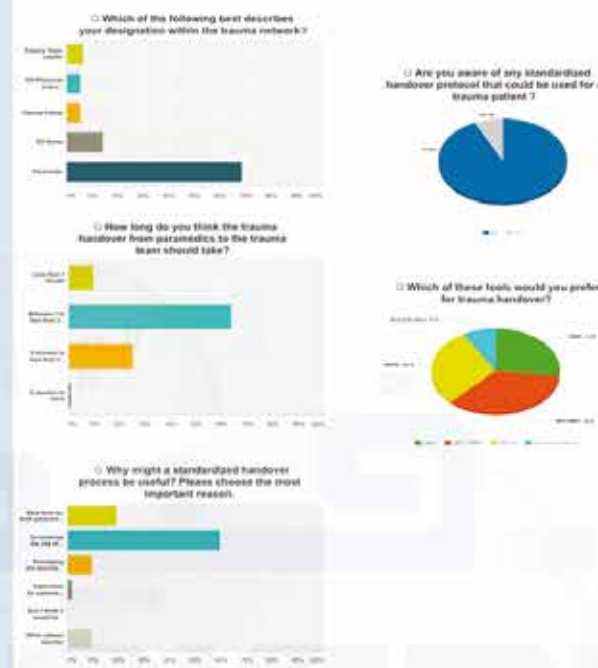
As mentioned earlier in the introduction, there are several factors that act as a barrier to conduct the proper information to the proper personnel. These factors include stress, lack of time, loud noises, omitting underestimated facts, flowing different protocols, forgetfulness and work load. Adding to that the nature of humans, also known as human factor, that will further increase the chance of data miss conduction.

In addition to that, different people are applying different protocols, our statistics showed a wide diversity in the number of protocols used, and few of the participants were aware of the other protocols that they are not using. This indeed increase the chance of misinterpretation of data and as a result may affect the overall outcome of the patient.

The participants of our study think that building a standardised handover needed in their field is important for 1. Save time for both paramedics and ER nurse/ER physician/Trauma Team Leader, 2. To minimise the risk of missing important information, 3. Prioritising the severity of injuries, 4. Implication for patients subsequent hospital treatment and trajectory of care.

Time is very valuable in the emergency department, our study focuses on making a standard protocol that not only utilizes the time efficiency, but also minimises the busyness of verbal communication as well. When the participants were asked about the duration needed to deliver the data from the paramedics to the trauma team, the majority said that it should be between one to less than three mins. Adding to that the environmental and human factors, will negatively impact on the information transfer during clinical handover.

Graphs



Results and Conclusion

When asked about the need of unified protocol 61.54% thought that the standardised handover is needed, while the other 38.46% disagreed. 19.23% said it will save time for both paramedics and ER nurses/ER physicians/Trauma Team Leaders, 9.62% said it prioritising the severity of injuries, 1.92% thought it will implicate for patients subsequent hospital treatment and trajectory of care. 9.62% said other than above mentioned. Regarding the awareness of other protocol, the study found that 92.94% are not aware of any, while only 7.06% are aware of other protocols. 27.38% of them are using ISBAR, 29.76% are using IMIST-AMBO, 29.76% are using EMSTO and 8.33% are using other different protocols.

The study showed a majority agreement of the necessity to develop a standardised handover to be used in order to improve the overall outcome of the health service. It also showed that the other protocol usage is almost equal, which increase the chance to have bias outcome through data exchange, and hence, the need of standardised handover is justified.

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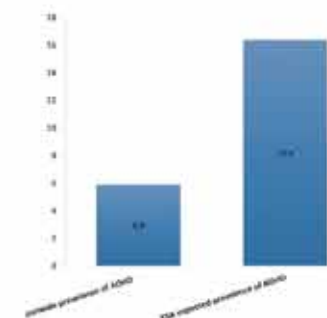
Category: Innovation
UG - M45 - Naji 2016

Mental Arithmetic as a Potential Innovative Non-Pharmacological Therapy for ADHD Symptoms

Hamzah Naji, Ibrahim Muhsen, M. Marwan Dabbagh, Alawwab Dabaliz, Yazan Honjol, Akef Obeidat

BACKGROUND

Attention deficit hyperactivity disorder (ADHD) is one of the most common neuropsychiatric disorders worldwide with prevalence of approximately 5.9% to 7.1%. In Saudi Arabia, studies have demonstrated markedly higher prevalence rates, up to a striking 16.4%. Currently, pharmacological treatment is the first-line of therapy but studies indicate that several side effects are associated with their long-term administration. Several studies have suggested non-pharmacological ADHD therapies but with variable efficacies.



IDEA

We propose the use of a specially tailored mental arithmetic course as a potential non-pharmacological therapeutic attempt, sans side effects of medication. If proven effective, it can potentially be used by families and schools to improve ADHD symptoms.

Our study aims to investigate mental arithmetic as an available innovative non-pharmacological treatment for ADHD, and study its effectiveness on ADHD symptoms.

Short Term Goal

- ✓ Enrich course content & modify duration, according to our subsequent course-efficacy studies.
- ✓ Promote the integration of tailored mental arithmetic courses within traditional school curricula.
- ✓ Introduce a physical exercise module to the program as a supplement to aid synergistic benefit of two therapies.

Future Plans

ACTION PLAN

1. **Recruitment:**
 - AFTA society & National Neuroscience institute in King Fahad Medical city.
 - Recruit 120 early adolescents diagnosed with ADHD.
 - Diagnosis will be re-assessed with DSM-V.
2. **Randomization:**
 - 120 subjects randomly assigned into 2 groups; Intervention & control
3. **Course administration and Assessment of Improvement:**
 - 48-hour certified mental arithmetic course over a period of 6-months.
 - Will be taught to use a counting frame (abacus) to solve complex arithmetic operations.
 - Subjects' symptoms will be evaluated before & after the course using Test of Variables of Attention (T.O.V.A.) as a Continuous Performance Test.
4. **Data Analysis:**
 - The comparison between the 2 groups will rely on the t-test and/or non-parametric methods
 - Categorical variables will be based on chi-square/Fisher exact testing.
 - Level of significance will be assigned at ($p < 0.05$).



UG-M46-Abou Al-Shaar 2016
Category: Research

An Endoscopic Road Map To The Internal Carotid Artery Navigating Through The Ventral Cranial Base

Mohamed A. Labib, Hussam Abou Al-Shaar, Daniel M. Prevedello, Ricardo Carrau, Edward E. Kerr, Cristian Naudy, Martin Corsten, Amin Kassam

College of Medicine, Alfaisal University, Riyadh, Saudi Arabia. Departments of Neurosurgery and Otolaryngology-Head and Neck Surgery, The Ohio State University, Columbus, Ohio, USA and University of Ottawa, Ottawa, Ontario, Canada

Background

Endoscopic endonasal approach to the ventral cranial base allows excellent access and visualization of lesions along the median sagittal plane (extending from the crista galli to and through the odontoid process). However, one of the most feared complications of endoscopic endonasal surgery is injury to the internal carotid artery (ICA). Injuries to the ICA have been associated with both microscopic and endoscopic endonasal approaches. In 1 survey, the rate of injury varied from 0.4% for experienced surgeons to 1.4% for surgeons with less experience.

Objectives

1. To understand the anatomy of the ICA and surrounding structures
2. To provide a complete endoscopic classification of the segments of the ICA
3. To identify important landmarks for each segment of the ICA to minimize the risk of injury

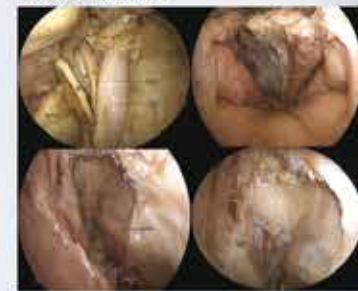
Methods

Five fresh and 28 formalin-preserved cadaveric specimens were studied in detail for anatomy and the presence of ICA anatomic variations. Morphometric analyses of the ICAs were made in 12 of the formalin-preserved cadavers for a total of 24 measured ICAs. Measurements were made on the medial-most aspect of each ICA segment. All measurements are expressed in millimeters \pm 1 SD. We examined the ICAs in all 33 cadavers for the presence of anatomic variations from the parapharyngeal segment to the intracranial segment.

Results



1. Parapharyngeal ICA



2. Petrous ICA



3. Paracaval ICA

4. Paracaval ICA



5. Paracaval ICA

6. Intracranial ICA

ICA Segment	Length \pm SD, mm
Petrous	14.8 \pm 4.3
Paracaval	11.8 \pm 0.7
Paracaval	23.7 \pm 6.1
Paracaval	10 \pm 0.7

ICA Segment	Length \pm SD, mm
Petrous	21.3 \pm 2.8
Paracaval	18.3 \pm 2.5
Paracaval	11.7 \pm 3.2
Paracaval	11.7 \pm 3.2

ICA Segment	Modular Approaches
Parapharyngeal	Lower one third transoral, transnasal, inferior petrosal, far medial approaches (transcavernous tubercle, transcondylar approach)
Petrous	Infratemporal fossa, inferior petrosal, front door to Meckel's cave
Paracaval	Medial third transoral, medial petrosal, apex, front door to Meckel's cave, anterior cavernous sinus
Paracaval	Cavernous sinus, upper one third transoral, transoral, transcondylar, and transnasal
Intracranial	Upper one third transoral

Conclusion

Injuring the ICA is arguably one of the most debilitating complications of endoscopic endonasal cranial base surgery. The fear of injuring the ICA may limit and jeopardize the extent of resection. Being able to accurately predict the location of the vessel intraoperatively before actually visualizing it is crucial for performing safe and effective approaches. This is the first complete and comprehensive classification of the ICA segments with particular attention to surgically relevant endoscopic endonasal landmarks.

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UG-M47-Abou Al-Shaar 2016
Category: Research

Duodopa Therapy in Advanced Parkinson's Disease

Hussam Abou Al-Shaar, Saeed Bohlega, Thamer Alkhairallah, Fahad Al-Ajlan, Nael Hasan, Khalid Alkahtani

College of Medicine, Alfaisal University; Division of Neurology, Department of Neurosciences and Division of Gastroenterology, Department of Medicine, King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia

Background

Parkinson's disease (PD) affects 0.3% of the population, increasing to 1-2% in older (>60 years) individuals in the developed countries. Oral levodopa has been the mainstay treatment for PD patients, due to its efficacy in reducing the signs and symptoms encountered among PD patients. However, with the long term levodopa therapy and advancement of the disease, one-third of PD patients develop motor fluctuations within 3 to 5 years and within 10 to 12 years almost all of them are affected. Levodopa-carbidopa intestinal gel (LCIG) monotherapy has shown statistically significant improvement in motor and non-motor symptoms as well as motor fluctuations and dyskinesias among advanced PD patients in multiple studies.

Objectives

To report the report the first Middle Eastern and Asian single tertiary care center experience with LCIG therapy.

Methods

A prospective single movement disorder center study of 20 consecutive patients with advanced PD with motor fluctuations and non-motor symptoms. Patients' demographics, PD onset, duration, "off" time, pre-LCIG unified PD rating scale (UPDRS III) during the "off" time, post-LCIG UPDRS III during the "on" time, non-motor symptoms scale (NMSS), PD questionnaire-8 (PDQ-8), follow-up period, LCIG dose, and complications were collected prospectively and assessed periodically during the study period. All patients were admitted to the hospital and underwent nasoduodenal tube insertion under endoscopic guidance. LCIG doses, which were divided in two portions, namely a morning bolus dose and a continuous hourly dose. We investigated our patients for the development of any adverse event/complication.

Results

Twenty patients (7 females [33%] and 13 males [67%]) were recruited over a period of 6 years. Two patients underwent the nasoduodenal tube trial but did not have a permanent PEG tube insertion due to inability to control the dyskinesia in one patient and bleeding tendency in another. Out of the 18 patients included in the analysis, young-onset PD (i.e. <21 years) was found in 7 patients (38.9%), juvenile parkinsonism (i.e. <20 years) was encountered in 1 patient (5.6%), with the rest (55.6%) diagnosed with PD (i.e. >40 years). Disease duration prior to LCIG infusion ranged from 5 to 18 years (mean 11.4 \pm 4.2). Mean follow-up time on LCIG therapy was 48.5 \pm 23.2 months (range 11-83 months).

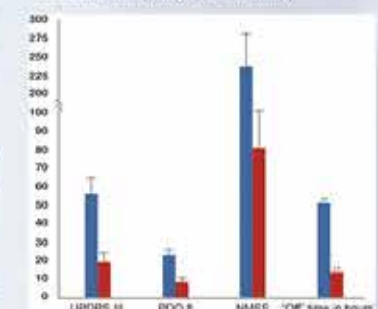


Fig. 1: Bar diagram demonstrating the mean \pm SD improvement in the UPDRS III, PDQ-8, NMSS, and "off" time in hours from pre-LCIG to 0 months post-LCIG therapy. *Each 15 points in the y-axis corresponds to 1 hour for the "off" time measurement.

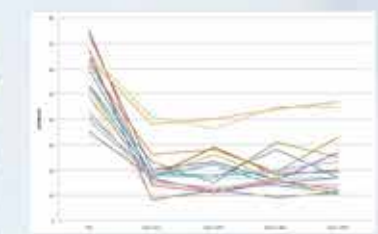


Fig. 2: Line diagram representing UPDRS III measurements recorded at different intervals during the 24 months of the study. Each line represents an individual patient.

Complication	Number of patients
PEG surgery-related adverse events:	0
LCIG-related adverse events:	1
Uncontrollable dyskinesia	1
Hardware-related adverse events:	2
Skin infection	2
Skin rash	1
Tube dislocation	10
Tube knotting	2
Pump malfunction	3
Pump breakage	2
PD-related adverse events:	1
Spine fracture	1



Fig. 4: Examples of the problems associated with tube function.



Fig. 5: Radiological examples of tube complications.

Conclusion

LCIG infusion monotherapy demonstrated significant improvement in reducing the "off" time, reducing levodopa-induced dyskinesia, and improving non-motor symptoms and quality of life. It is recommended for patients in whom motor fluctuations are inadequately treated with traditional oral PD therapy.

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UG-M48-Abou Al-Shaar 2016
Category: Research

Phenotypic comparison of individuals with homozygous or heterozygous mutation of NOTCH3 in a Large CADASIL Family

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Background

Cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL) is an adult onset inherited arteriopathy, characterized by non-hypertensive, non-arteriosclerotic, small arterial granular degeneration. CADASIL manifests as recurrent subcortical ischemic events, progressive or stepwise subcortical dementia, migraine with aura, and mood disorders, with early death. CADASIL has been reported in various populations around the world.

NOTCH3 mutations are considered to underlie CADASIL. NOTCH3 is mainly expressed in smooth muscle cells of small arteries and in pericytes around capillaries. Almost all mutations reported so far are missense mutations that result in a gain or loss of one cysteine residue within an EGF-like repeat domain. However, only a few cases in the literature reported homozygous mutations of NOTCH3.

Objectives

To report the largest number of homoallelic cases of CADASIL in one family to date and describe and compare the phenotypes of homozygous and heterozygous members within this family.

Methods

1. Patients

Thirteen affected individuals from a 3 generation family were enrolled for this study (Figure 1).

2. NOTCH3 Sanger Sequencing

DNA was isolated from whole blood using a standard salt precipitation method using a Gentra Puregene blood kit. Sequencing of the entire coding and flanking regions of NOTCH3 was undertaken using PCR amplification and direct Sanger were used to align sequence data with NOTCH3.

Results

The family reported in this paper originated from Kashmir in the North Eastern part of the Indian sub-continent and included 13 affected individuals spanning 3 generations as described in Table 1 (Figure 1&2). Of note, the last generation is a product of triple loop consanguinity.

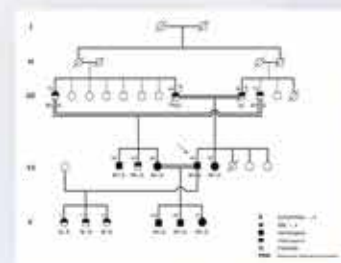


Figure 1: Family pedigree showing high degree of consanguinity, number at risk of the affected individual's age, points to the index case.

Molecular Genetic Analysis:

Direct sequencing of the 33 exons of NOTCH3 in the index case showed a homozygous C > T transition at nucleotide 3769 (C3769T) predicting an amino acid change from Arginine > Cysteine at position 1251 (R1251C). Segregation of this mutation was studied in 12 other individuals of this family identifying 6 homozygotes and 6 heterozygotes as shown in Table 1 and Figure 3.

Pro	Age	Sex	Consanguinity to Sister Case	Clinical Features	Genotype	Genotype Cx-F
115	10	F	Consanguinity (sister in Law)	Asymptomatic	Recessive	0.0
116	10	F	Consanguinity (sister in Law)	Asymptomatic	Recessive	0.0
117	10	F	Consanguinity (sister in Law)	Asymptomatic	Recessive	0.0
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UG-M50-Mansoor2016

TBL as a learning, personal development and exam preparation tool within a PBL System: Subjective and Objective Evidence

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Background

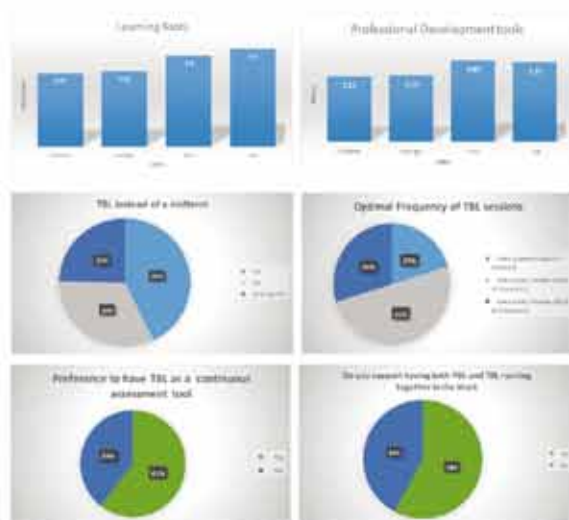
Neuroscience is one of the most intriguing yet challenging areas of study in medical school. We introduced Team Based Learning (TBL) as a means of continuous assessment and learning, parallel with the originally running PBL system in the Neurosciences block (NSB) as an innovative approach. We aim to study any measurable effect of TBL component on students' preparation (subjective to their opinions) and in-course performance (objective).

Methods

Data was collected through paper-based questionnaires from second-year medical students. Furthermore, we carried out an objective comparison between the current batch of students' grades at the end of the new TBL-NSB and those of the previous year's batch, who did not have TBL in their block.

Results

The majority of responses leaned towards affirmation of pro-TBL outcomes. Results showed that students' cGPA has a significant impact on whether they believe that TBL was an effective tool in improving their learning ($F=5.498$, $P<0.01$) and professional development ($F=4.773$, $P<0.01$). Data analysis from the grades of both batches revealed a significantly higher performance in the new batch of students who took the TBL-NSB over those who took the conventional non-TBL one.



Discussion

TBL outcomes were evaluated in terms of three levels of educational benefits— as a learning, professional development and exam preparatory tool. The majority of students appreciated the importance of TBL in those domains, especially weaker students. The significant difference we found between the two batches' grades shall be attributable to the introduction of TBL in the new NSB curriculum since all other factors are constant including syllabus, teaching faculty and learning resources.

Conclusion

TBL is a satisfactory learning, personal development and exam preparatory tool as demonstrated by subjective and objective evidence.

UG-M51-Alam2016,
Category: Research

Estimation of Plasma Homocysteine Level in Young Healthy Population of Saudi Arabia

Santosh Kumar, Sreyoshi F. Alam, Heba Musallam, Ghazal M. Binsultan, Hajar A. Alreeli, Ghadah N. Binzuman, Zahraa M. Qamhieh, Sara M. Maaz, Ahmed Yaqinuddin, Paul Ganguly

Background

Homocysteine:

A sulphur containing amino acid. An intermediate product in biosynthesis of methionine and cysteine, with B-complex vitamins affecting its metabolism as co-enzymes.

Hyperhomocysteinemia:

Elevated plasma level of homocysteine is being increasingly associated with many diseases: Cardiovascular diseases, stroke, Alzheimer's disease, Parkinson's disease, diabetes, non-alcoholic fatty liver disease (NAFLD), hearing loss, macular degeneration, and migraine.

However, there are no studies reporting plasma homocysteine levels for normal Saudi population.

Aim

Establishment of the methodology protocol for determining plasma homocysteine level using high pressure liquid chromatography (HPLC) at Alfaisal University campus.
To determine plasma homocysteine levels in young (18 – 25 years old) healthy Saudi population (who have no known diseases which are associated with elevated plasma homocysteine levels).

Methods

- 5 ml of blood via venipuncture from the consenting individual.
- The first and foremost component is establishment of the protocols and optimized methods for determining serum/plasma homocysteine level.
- We have established the protocols and optimized methods for determining serum/plasma homocysteine level using:
 - The Waters High performance liquid chromatography system,
 - The Waters fluorescence detector.
 - The Empower pro software for data generation.
 - Chromsystems Reagent kits to process and run serum/plasma samples through HPLC.

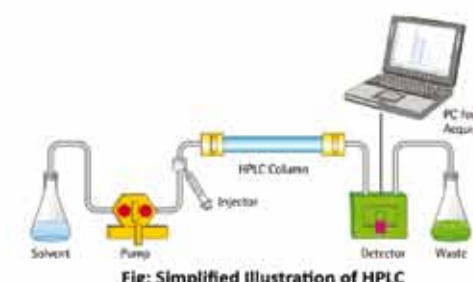
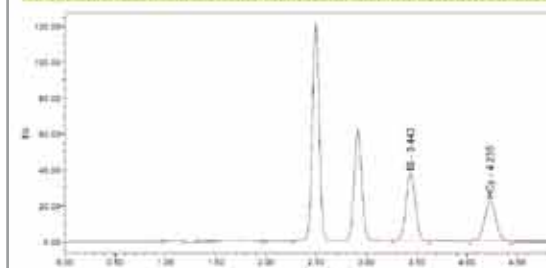


Fig: Simplified Illustration of HPLC

Results

- We have established the protocols and optimized methods for determining serum/plasma homocysteine level using high pressure liquid chromatography (HPLC).
- The following image and table shows a typical chromatogram of a plasma calibration standard, acquired during one of our recent experiments done to calibrate and optimize the instrument.



Peak Name	RT	Area	Area (%)	Height	Concentration	Units
Internal Standard (IS)	3.443	2466480	58.37	381212	1.000	
Homocysteine (HCy)	4.235	1759267	41.63	225434	15.200	µmol/L

Figure: Typical chromatogram of a plasma calibration standard

Discussion/Conclusion

Plasma levels of homocysteine are potentially amenable to therapeutic (with B-complex vitamins) and dietary interventions. Better understanding of homocysteine level and its contributing factors in normal Saudi population will help design interventional therapeutic and preventive studies, leading to possible simple but important health care recommendations which may reduce burden of the above mentioned chronic diseases in the Kingdom.

Future Goals

- To investigate the co-factors (any of folate, vitamin B6, vitamin B12, and H2S levels and MTHFR C677T/A1298C polymorphisms) which may affect plasma homocysteine levels.
- Follow-up of the consenting individuals on yearly basis for the next 6 years to study changes in plasma homocysteine levels over this period.

Fatima Siddiqui, Modhi Alhussinan,
Noudjouma Mohamed, Raihan Sajid, Sharouk Khanjar, Tawfik AbuAssale

Expert PBL tutor vs Non-expert tutor: which is better in problem based learning?

BACKGROUND

Trends in health professions trainee education are shifting from passive to active learning due to the belief that it results in enhanced knowledge retention and skills acquisition. In the PBL sessions the students are provided with well structured problems or cases, so the students can generate objectives that links their basic science knowledge into practical scenario. Many studies have examined whether being an "expert" or subject specialist influences the success of a tutor in a problem-based learning curriculum.

OBJECTIVE

This study is to evaluate the impact of Expert PBL tutor vs non expert tutor on the learning process

RESULTS

I think the educational background of my facilitator expertness affect the quality of my learning process?



I prefer my facilitator



DISCUSSION & CONCLUSION

Most of the students performed better with expert facilitators, and had positive outcomes related to learning in the areas of content knowledge, collaborative skills, engagement and motivation, and critical thinking. Also, more than half of the participants preferred expert PBL facilitator over non expert facilitator.

Acknowledgement: This study is part of MERG. Thank you for whoever helps

Enhancing PBL by integrating research competencies in regular PBL sessions: A pilot study.

Jumana Sarraj, Hamza Naji, Ahmed Qannita, Shouq Kherallah, Ibrahim Mubsen, Dr. Mohammed Raihan Sajid

Introduction :

Problem-Based Learning (PBL) has a unique designed educational approach that permits discussion, critical thinking & self-directed learning. PBL has helped transform medical education in pre-clinical years from a passive to an active process. It also plays a role not only in developing scientific curiosity but also in bracing students to become professionals capable of playing multiple roles in practice. Those characteristics make PBL an attractive and potentially suitable modality to be utilized for research education. This research aims to investigate students' perspective on integrating competencies pertaining to biomedical research concepts and skills into the PBL.

Methodology :

- 1- A group of educators and students have modified a number of PBL cases by integrating some research competencies and Evidence-based medicine topics within the case scenarios (E.g. concepts of 'Randomized control Trials' and 'Sensitivity and specificity').
- 2- These topics were integrated by using three main tools: (I) Question boxes (II) Reference boxes and (III) Enhancing the scenario of PBL to elicit students' curiosity.
- 3- The modified PBLs were given to students through multiple official PBL sessions conducted at Alfaisal University. 4 groups were involved (n=40)
- 4- Feedback of those students was collected through surveys and interviews.

The ED physician said to the patient that his ECG findings are suggestive of blockage of at least one of his coronary arteries. He also added that cardiac catheterization facilities were not available. Hence he would be offered intravenous medication that would help open his blocked artery. Moreover, he explained to the team that, according to the guidelines, both catheterization and intravenous medication are class I recommendation with Level A and Level B evidence respectively.

What is the most important lab investigation that should be done in this situation?

What other laboratory investigations should also be ordered at this stage?

What are the different Levels of Evidence (LOE) and how does the type of studies done affect it?

Reference box:

Please refer to the following study as an example of RCT.

Cannon CP, Blazing MA, Giugliano RP, et al. Ezetimibe Added to Statin Therapy after Acute Coronary Syndromes. *N Engl J Med* 2015; 372:2387.

Figure (1): Examples of different methods that were used to enhance PBLs

Results :

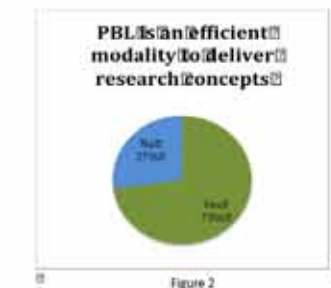


Figure 2

Results showed that even though most students (73%) believed that PBL is an efficient modality to deliver Research objectives; 61% of them indicated that research objectives should not be integrated with each PBL. Students slightly agreed that these PBLs have enhanced their understanding of the added concepts (mean Likert scale value of 3.11), with a preference towards using Question Boxes (Mean Likert Scale value of 3.67) Furthermore, interviews provided an additional perspective on reasons that led students to discourage this integration, in example: Distracting the students from the main objectives of the cases and the need of additional time to prepare the PBL.

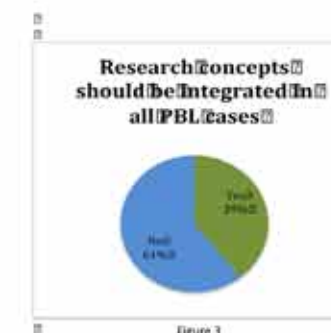


Figure 3

Conclusion:

In conclusion, the results encourage the integration of research and evidence-based medicine concepts in the context of PBL, given that objective shouldn't be integrated in all PBL cases. Educators must appreciate the context, complexity and the suitability of the integration. More insights can be achieved by case-control studies.

UG-M55-Albarqawi2016

The Implementation of a Patient-Assisted Mobile Teledermatology (PAMT) Program in Saudi Arabia: Dermatologists' Perspective

Haneen Salah Albarqawi, Haya Jamal Azouz, Dr. Peter Cahusac, Dr. Saad Alajlan



Background:

- Teledermatology, which is the use of technology for an expanded access to patient data in order to achieve patient care over distance, has been subjected to extensive research in the past decade.
- Literature has reported many advantages of using teledermatology, including reduced waiting time and costs on patients.
- Dermatology is primarily a visual specialty that depends on clinical and histopathological images, many studies have shown that the use of teledermatology has resulted in accurate and reliable diagnoses of a variety of skin disorders.
- Recently, smartphones have been increasingly accessible and affordable for the majority of patients and doctors; thus, this brought up what is called Patient-Assisted Mobile Teledermatology (PAMT), in which the patient seeks and receives medical advice directly from the dermatologist to their mobile phones.

What is Patient-Assisted Mobile Teledermatology?



Patient takes pictures for his/her skin lesions

Patient submits the pictures along with their medical history online through a mobile application

Dermatologist receives patient data through the mobile application

Dermatologist submits consultation or medical advice to the mobile application

Patient receives the consultation or the medical advice directly from dermatologist to their smartphone

Results:

Appropriate statistical analyses, such as correlations, chi-square and t tests, were carried out on the data using SPSS version 21. Statistical significance was determined by $p < .05$. The total number of participants was 38 full licensed dermatologists. Out of the total number of dermatologists, 25% were Saudi, while 75% were non-Saudi. Further, 37.5% of the doctors were from governmental institutions, while 60% were from private hospitals.



Regarding their exposure to the concept of PAMT, 34.2% non-Saudi dermatologists reported that they have been exposed to this concept compared to 2.6% of Saudi dermatologists ($p = .021$). Furthermore, 36.8% of male dermatologists have used PAMT in their practice compared to 18.42% of female dermatologist ($p = 0.023$). 44.7% of male dermatologists are willing to use PAMT to follow up with previously consulted patients for chronic skin diseases compared to 23.6 females. Furthermore, 34.2% of dermatologists working in governmental and 31.6% of dermatologists working in private hospitals indicated their willingness to use PAMT in the future.

Conclusion:

Patient-Assisted Mobile Teledermatology (PAMT) is an evolving field, which if invested and used appropriately, will certainly drastically amend the care provided to patients by: 1) providing an ongoing mean of contact between the physician and the patient 2) saving time for physicians and hence providing more time for new consultation and 3) improving the outcomes of dermatology care in Saudi Arabia.

Future Plans and Recommendations:

- 1- Raising awareness about the safety and the importance of adapting a PAMT system among Saudi patients.
- 2- Implementing a PAMT service for following up chronic dermatological conditions as an initial step.
- 3- Developing a Saudi module for PAMT based on dermatologists recommendations.
- 4- Ensuring patient utmost privacy and accounting for Saudi cultural concerns of stigmatization

Is Saudi Arabia Ready?

Determining the Effect of Long On-Campus Study and Work Hours on Academic Performance

Authors: Maha Hameed; Bashaer Alsomali; Hajar Alreefi; Naif Alkadhibi; Santosh Kumar
College of Medicine, Alfaisal University, Riyadh, Saudi Arabia

Objective

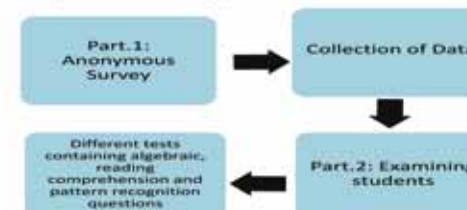
The aim of this study is to investigate the effects of staying at university for long hours on medical students' academic performance

Background

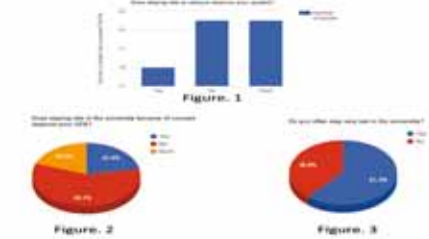
- A fair amount of research has been conducted on the impact of long working hours in the context of medical staff and firefighters.
- However, there is a great paucity in literature on the dilemma of students studying and staying at university for extensive hours.

Methods

- The first part of our research involves an anonymous survey for students, evaluating their perceptions on this matter.
- The survey was conducted by email and spread to the respective batch years (MBBS 1st, 2nd, 3rd, 4th and 5th).
- Questions involved asking:
 - 1- How long the students normally stay at university
 - 2- How often they leave the university in the night
 - 3- How staying late on campus improved their grades



Results and Data Analysis



- Results were collected from a total of 67 students (36% male and 64% female) from the MBBS pathway.
- The average time a student spends at university is 7 hours, whereas the average study time is 5.
- 60% of respondents stay late on campus everyday; however, only 25% stated that it has a positive impact on their GPA.

Conclusion

Although majority of students stay late at campus, many perceive it to be detrimental to their academic performance.

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UG-M59-Alkhani 2016
Research - Medicine and Health Science

Catching Up with The Trends in Teaching and Learning in Saudi Arabia

Ismael Alkhani, Basel E. Tamimi, Zeina Kayali, Ghada AlHayaza, Mazen AlMasri, Anikó Szabó

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Background

- Providing lectures accompanied by slideshow presentations have been the gold-standard for most of the lecturers in the 21st Century medical education.
- They are often uninspiring. Students complain that attending lectures is not worthwhile.
- Frequently, students seem to attend lectures for the sake of marking their attendance for grades.

Methodology

A number of students (122) has been surveyed from different academic years (1st, 2nd and 3rd year students).

Results

Answer to first question: Lecturers tend to just read their own slideshows with the students, with no obvious explanations.

Answers to second question:

- Less information on one slide
- Keywords in a table
- Using animations/videos
- Using etymology
- Using historical information

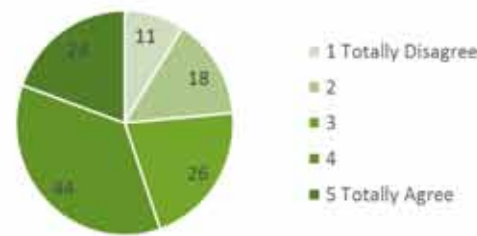
Conclusion

We identified two major ways to improve slideshow presentations to bring them to a higher level. First, combining different methods of teaching. Second is to incorporate historical, etymological and current information about the subject. With the help of the Internet, these two suggestions are easily accessible. Higher level slideshow presentations will maintain attendance in the hall, not for marking attendance.

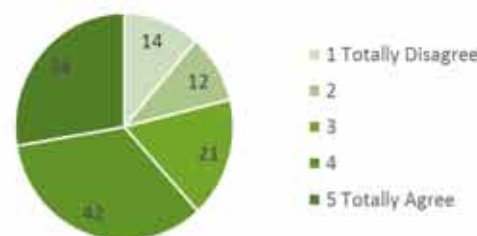
Objectives

- Students have been heavily relying on PowerPoint presentation (slideshows) as their main source of studying. This has been the main source for quite some time now, and that is because this is the source that most university professors are giving for their students.
- There were two major questions that we wanted to ask the students to gain more information about this topic and why and what change must happen.
 1. Why are power point lectures boring?
 2. What would make a slideshow lecture more interesting?

Explaining Etymologies (roots or origin of words)



Using YouTube (or other sources) Videos



UG-M60-Shariff 2016
Research

Free Esophageal Perforation Following Hybrid Visceral Debranching and Distal Endograft Extension to Repair a Ruptured Thoracoabdominal Aortic Aneurysm

Rimsha Shariff, Hussam Abou Al-Shaar, Khaled Juan Zaza, Muhammad Anees Sharif, Samer Koussayer

College of Medicine, Alfaisal University, Riyadh, Saudi Arabia; Division of Vascular and Endovascular Surgery, Department of Surgery, King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia.

Introduction

Esophageal necrosis after exclusion of the aneurysmal segment of the thoracic aorta is a rare event. In such cases, the esophageal necrosis can present as either an aorto-esophageal fistula or free esophageal perforation [1-6]. To the best of our knowledge, only three cases of free esophageal perforation following endovascular repair of thoracoabdominal aortic aneurysm have been described in the published literature, all with a fatal outcome [4-6]. Herein, we report the first case of successful management of a free esophageal perforation following emergency hybrid visceral debranching and distal endograft extension to repair a ruptured thoracoabdominal aortic aneurysm.

Case Report

A 58-year-old male presented with a type I thoracoabdominal aortic aneurysm (TAAA) measuring 62 mm in maximum diameter. The patient received elective thoracic endovascular aortic repair (TEVAR) of type I TAAA. Three months follow up computed tomography (CT) angiogram revealed complete exclusion of the thoracic aortic aneurysm with no endoleak (Figure 1A).

Four years and seven months later he returned with a new aneurysm extending from the distal end of the thoracic stent graft to the aortic bifurcation, including all visceral arterial branches. The superior mesenteric artery (SMA) and both renal arteries were severely stenosed with an atrophic right kidney (Figure 1B, C and D). Isotope renal scan revealed a functional left kidney (90.5%) and a non-functional right kidney (9.5%) (Figure 1E). During his hold to undergo an elective repair, the TAAA ruptured, a chest x-ray revealed a widened mediastinum with ruptured TAAA (Figure 2A). An emergency hybrid procedure was performed.

The patient underwent auto transplantation of the left kidney to the right limb of the ABE. The patient made an uneventful recovery without renal dysfunction or neurological deficit and was discharged at seventh postoperative day. A pre discharge CT scan demonstrated exclusion of the aneurysm with no endoleak and functioning right pelvic kidney (Figure 2B, C and D).

The patient was readmitted a week later with chest pain. A thoracic CT scan demonstrated old posterior mediastinal hematoma with bilateral pleural effusions and emphysema (Figure 3A). He underwent bilateral thoracotomies and decortications. Postoperatively, the left sided chest tube was noted to drain the entral feed and an esophagogram confirmed distal esophageal leak (Figure 3B). The patient required a gastric pull up and esophageal resection due to postoperative occurrence of esophageal perforation, secondary to ischemic necrosis. Six months post the gastrointestinal restorative procedure, the patient presented in a good condition.

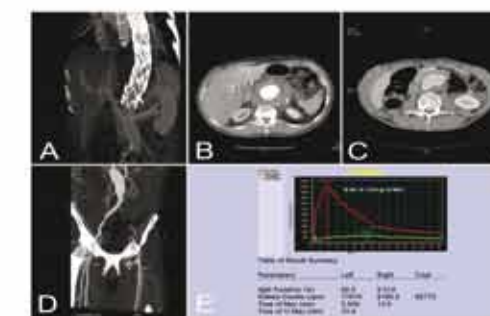


Figure 3. A thoracic CT scan showing infected hematoma in the posterior mediastinum and bilateral pleural effusion (A). An esophageal gastrografin study (B) showing the extravasation of the contrast into the mediastinum 28x163mm (100 x 100 DPI).

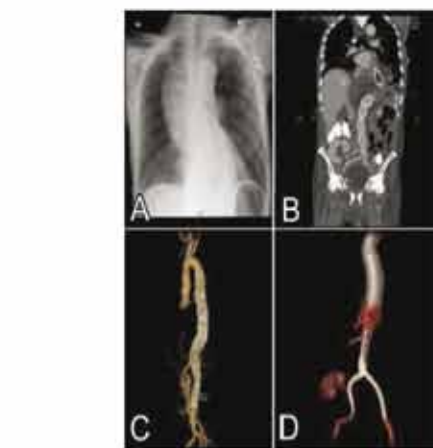


Figure 1. Baseline CT angiogram demonstrating complete exclusion of the thoracic aortic aneurysm with no endoleak following elective repair (A). Four and a half years later, axial (B, C) and coronal (D) CT angiogram showing the development of a new aneurysm extending from the distal end of the thoracic stent graft to the aortic bifurcation with occlusion of the left common and external iliac arteries. Renal scan indicating a functional left kidney (90.5%) and a nonfunctional right kidney (9.5%) (E). 411x331mm (100 x 100 DPI).

Conclusion

Esophageal perforation following hybrid visceral debranching and endovascular repair of a ruptured TAAA is a rare and life threatening complication. The interplay between ischemia, compression and sepsis are the proposed basis of esophageal necrosis and perforation. The lack of specific symptoms and physical signs can mask the early diagnosis resulting in high mortality. Therefore esophageal perforation should be suspected in all patients undergoing endografting for ruptured TAAA. Early esophageal exclusion is ideal for patients who cannot tolerate thoracotomy followed by a definite restorative surgery at a second stage.

Selected References

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Bicuspid Aortic Valve: Prevalence, Associations and Management Practices Among an Adult Population in a Large Echocardiography Database in Saudi Arabia

Authors: MOHAMMAD GH. ALGHAMDI, FAEZ A. ALRESAINI,
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Institution: King Abdulaziz Medical City (KAMC) – Riyadh, Saudi Arabia

UG-M62-Alresaini2016

Introduction:

Bicuspid Aortic Valve (BAV) has been reported as the commonest congenital cardiac malformation. BAV, as a separate clinical entity, has not been studied in Saudi Arabia (SA). The outcome of this study is expected to have a positive impact on patient care in the country.

Aim & Objectives:

The aim of this study was to determine the prevalence of BAV and the frequency of its associated cardiovascular abnormalities in King Abdul-Aziz Cardiac Center (KACC), Riyadh, Saudi Arabia.

Methods:

Retrospective, case-series study which included consecutive cases of echocardiography (echo) confirmed BAV disease. Cases were identified and reviewed using the electronic echo database (Xcelera®). The study covered the period between January 1st 2002 and December 31st 2011. Data entry, management and statistical analysis were conducted using Microsoft Excel 2010.

Results:

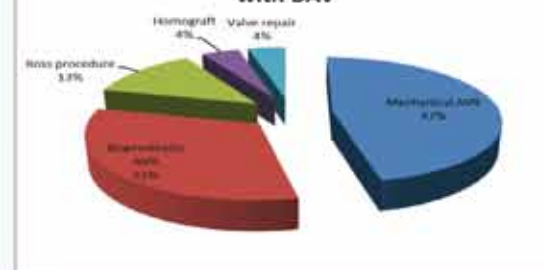
Out of 540 candidates who were labeled as or suspected of having BAV, 321 cases were confirmed to have the disease. Median age was 37 years and 92% were Saudi nationals. The overall prevalence was 0.6% and the annual incidence was 4 cases/1000 echo studies/year. BAV was more common in males (77%) with a male to female ratio of 10:1. Aortopathy and coarctation were present in 21% and 6.5% of cases, respectively. Aortic valve surgery was performed in 22% of cases, mostly in the form of valve replacement.

This study represents the largest study of BAV in Saudi Arabia. It was limited to the adult population as most of the clinical manifestations of BAV are detected at puberty and adulthood. The prevalence of BAV has been quoted as 1-2%. However, many recent studies reported a prevalence of less than 1%. A large adult echo database study reported a prevalence rate that is identical to ours (0.6%). The higher male predominance of BAV is very well known. The male to female ratio has been ranging between 2-4:1. Our male to female ratio was 10:1 which is higher than published data, despite a good female gender representation in the study. The degree of significant AR in our study was higher than reported figures in a similar cohort.

Conclusion / Recommendations:

males and 0.1% in females). Professional implementation of preschool and pre-employment screening is essential for early diagnosis. More national studies and multicenter databases are required.

Surgical procedures done in 71 patients with BAV



Echocardiographic findings in the study population (n=321)

Echo parameter	Mean ±SD or N (%)
Valve calcification	56 (17.4)
AVA < 1 cm ²	47 (14.6)
Peak PG > 60 mmHg	42 (13)
Mean PG > 40 mmHg	38 (11.8)
Aortic regurgitation:	
None	82 (25.5)
Less than moderate	194 (60.5)
Moderate or more	45 (14)
LV dilatation:	
Mild	19 (6)
More than mild	35 (11)
EF (%):	
> 50	275 (86)
30-50	31 (10)
Less than 30	15 (5)
LVH (any degree)	88 (27)
LA dilatation:	
Mild	44 (14)

Medicine & Health Science 7th Scientific & Research Day- Poster Competition



UG-M64-Bafadi2016

Islam Dahroug and Zain Bafadi

A Measure of Physical Activity's Impact on Academic Performance of Al-Faisal Students

Introduction:

- Exercises have been defined by American College of Sports Medicine (ACSM) as any exercise that is frequent (3-5d/w) with moderate to vigorous intensity. It also should be for 20-60 minutes per episode (or continuous 10 minutes) and with the mode of rhythmical exercise that use large muscles of the body.
- Data analysis suggests that exercise improves the academic performance and brain functions of students.



Objectives:

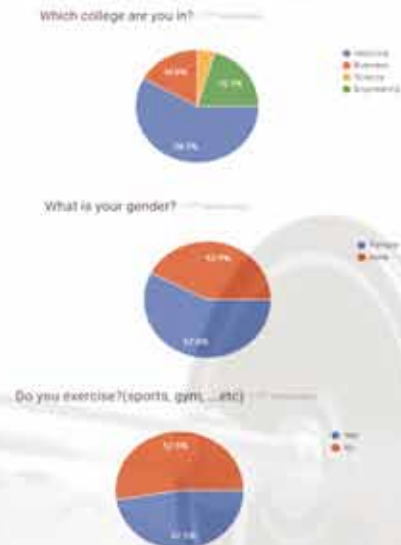
- To evaluate the association of physical activity of Alfaisal university students and the students' overall academic performance in their respective colleges as well as to promote exercising to the students.
- To compare between the students who exercise and students who do not.
- To indicate the extra effects of exercise on the mood and attention of students.
- To determine the university's role.

Hypothesis:

- Students who exercise have higher GPA than those who do not.
- Students who exercise have more trouble focusing and showing attention due to exercising that takes more of their time.

Results:

- The questionnaire resulted in a total number of 174 participants. Of the total number, 121 students agree that exercise plays a role in academic performance.
- The number of students who do not exercise are 92 (52.9%) of the 174 participants.
- Only 21% of the total number of participants engage in some form of physical activity at the university's grounds.



- Students' reasons for not exercising were mainly due to a shortage of time as their time is limited to include exercising in their schedules, and due to laziness.
- Students, who exercised, associated exercising with increasing their focus during lectures, making them more active, and affecting their mood positively.

Conclusion:

- Students who exercise admitted that they felt an increase in their tendency to focus more in their academic life as well as mood and participation boosts.
- Universities should provide variety of physical activity facilities
- Most students account lack of exercising and other problems such as fatigue due to poor time management.



References:
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2. Physical Activity and Health: A Report of the Surgeon General's Executive Summary
3. The Association between Physical Activity, Academic Performance, and Academic Performance
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5. Physical Activity and Academic Performance: A Review of the Literature
6. Physical Activity and Academic Performance: A Review of the Literature
7. Physical Activity and Academic Performance: A Review of the Literature
8. Physical Activity and Academic Performance: A Review of the Literature
9. Physical Activity and Academic Performance: A Review of the Literature
10. Physical Activity and Academic Performance: A Review of the Literature

UG-M65-Musallam 2016

Student perception on CPC effectiveness, variations in its format and role of grading it in pre-clinical undergraduate medical curriculum

Heba Musallam; Mays AL-Tahhan; Aisha Alharbi; Santosh Kumar
College of Medicine, Alfaisal University

Background:

- Clinicopathological Conferences (CPCs) is one of the instructional strategies of pathology which are used At Alfaisal University College of Medicine.
- Currently, CPCs is being conducted in two formats in different modules and grade CPC sessions in selected modules.
- There is paucity of literature on variations in CPC formats and the role of grading/summative assessment of the CPCs in undergraduate medical curriculum.

The aim of this study is to seek student's feedback on CPC as instructional modality in pathology, variations of CPC formats, and grading CPCs during the preclinical years.

Methodology:

- A cross-sectional survey-based study was conducted among medical students, 3rd and 4th year,
- A total of 25% of 4th year medical students and 15% of the 3rd year medical students have responded during the past 3 weeks
- We are still in data collection phase till April 30th.

Results:

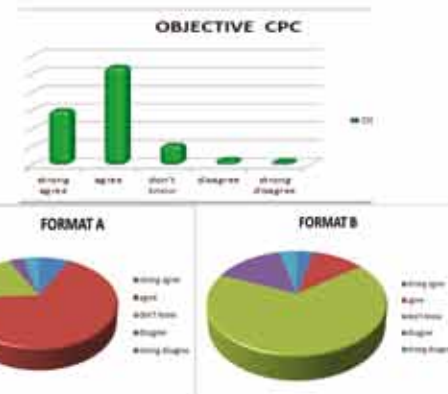
- Majority of students consider CPC as an effective tool for learning pathology.
- Format A has a higher preference rate compared to format B
- Grading the CPC is not much recommended by the students according to the initial data



Format A

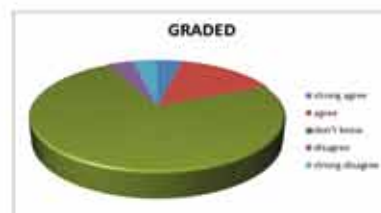


Format B



Discussion:

- CPC is popular among students as it provides opportunity to integrate clinical presentations with changes in morphology and to clarify concepts.
- Majority of the responses showed high acceptance to CPC in general, in which:
 - CPC offers good opportunity for interaction and team-work critical thinking as well as pointing out their weakness points
 - CPC will guarantee better understanding and an organized manner of exam preparations.
- Initial data is showing a clear preference to format A.
- Most of the students are in doubt of having a graded system.



Conclusion:

- CPC is perceived as a high-yield learning activity and is an effective instructional strategy that has to be an essential part of each module in pre-clinical year
- The most appropriate instructional strategy hasn't been decided yet.

UG-M66- Imran2016

The Effect of Medical and Nonmedical Parallel Courses on Medical Students' GPAs and Academic Performance

Syed Otaiba Imran; Sarah Mohammed Aftab Uddin; Najwa Samantha; Mariam Ahmed Glal; Mohammad Sharique Ahmad; Akef Obeidat; Santosh Kumar.
College of Medicine, Alfaisal University

Background

Medical students at Alfaisal University (Riyadh, KSA) are expected to take multiple parallel courses in addition to the core medicine courses. However, many students have complaints in regards to the fairness, value, and workload of such courses and believe they affect their academic performance negatively.

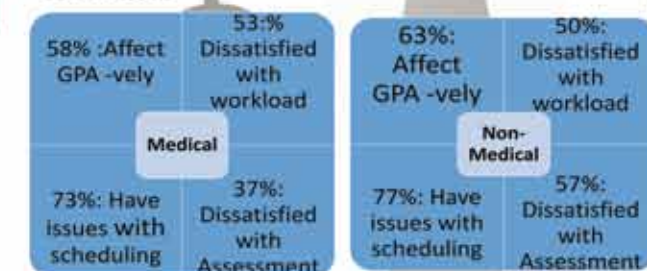
Methodology

A cross-sectional study conducted among Alfaisal University Medical students



An anonymous self-administered online survey-based questionnaire used. Excel and SPSS v.21 used in Data Analysis and Interpretation

Preliminary Results



Need for re-evaluation of Assessment system for Non-medical parallel courses
Further investigations into the effects on GPAs required

Objectives

This study aims to assess the opinions of Alfaisal Medical Students regarding Medical and Non-medical Parallel courses and to give quantitative evidence to their claims

Conclusions

Most common complaint is with scheduling of classes in exam weeks for both courses

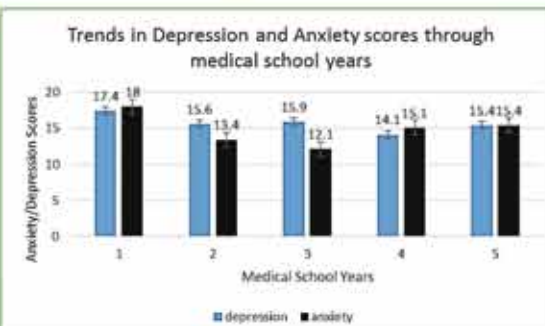
The Effect of Stress, Anxiety, and Depression on Academic Performance among Medical Students

Najwa Samantha Mohammad; Mariam Ahmed Glal; Mohammad Sharique Ahmad; Syed Otaiba Imran; Sarah Mohammed Aftab Uddin; Santosh Kumar

Background

Several studies have demonstrated that stress among medical students ranges from **12% to 63%**.

Study Aim: to assess the correlation between **anxiety** and depression among medical students in Riyadh, Saudi Arabia and (a) academic grades, (b) regularity of course attendance, (c) academic year, as well as to assess the prevalence of these entities.



Results

21% reported being diagnosed with anxiety and 20% with depression. **1/3 attributed a decline in their GPA over the years due to depression/anxiety.** Students reported that their depressive or anxious status is mostly affecting their overall performance in exams.

Discussion

Depression and anxiety are prevalent among medical students, and a correlation between these feelings and **poor academic performance** is demonstrated. Introducing **interventions** (i.e. counselling) may be beneficial.

Conclusion

Medical students years 1-5 reported depression and anxiety symptoms, and attributed poor academic performance to these symptoms.

Methods

Cross-sectional study



I find it difficult to work up the initiative to do things
I felt that I was using a lot of nervous energy

Strongly agree
Disagree

Depression among medical students is twice as high compared with the general population.

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Awareness and Prevalence of Obesity and Obesity-related Diseases among Medical Students – A Self-Reported Cross-Sectional Study

Nada K. Neel; Abdullah K. Neel; Akef Obeidat; Santosh Kumar, College of Medicine, Alfaisal University

Background

- Obesity is one of the most important factors affecting health in Saudi Arabia.
- There has been an increase in the prevalence of obesity amongst the young Saudi population in recent years.
- Awareness of the problem is necessary for any intervention to be successful.

Objectives

- To investigate the awareness about risk factors leading to obesity and its consequences amongst the studied population.
- To determine the prevalence of obesity and its risk factors amongst the studied population.
- To investigate dietary habits, physical activity, and family history of obesity in this population to explore any correlations with obesity.

Methods

Study group: Medical students at Alfaisal University, years 1-6.

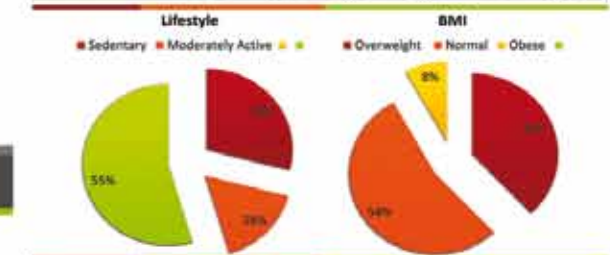
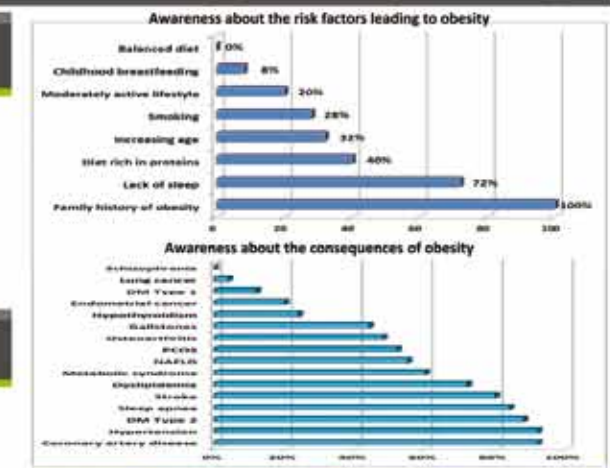
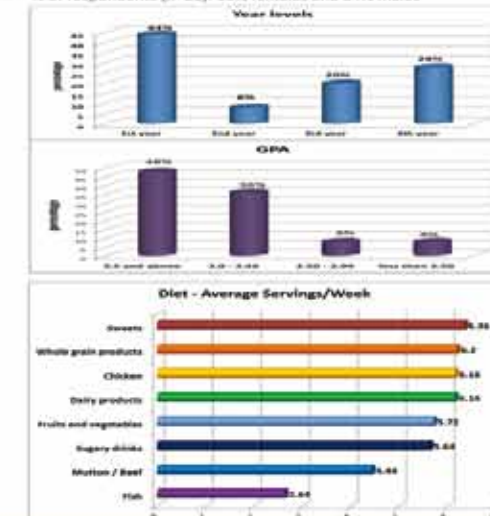
Methods: A cross-sectional study via a self-administered anonymous online survey with both qualitative and quantitative components.

The prevalence of obesity was determined based on self-reported weight and height.

Data Analysis: Data were processed and analyzed using Microsoft Excel and IBM SPSS Statistics version 21.

Preliminary Results

% of respondents (n=25): 16% females and 84% males



Discussion

- Lifestyle of the targeted population showed an increase in the prevalence of sedentary lifestyle which correlates to the high percentage of overweight BMI.
- It is recommended that a national policy encouraging physical activity and changing dietary habits toward healthy eating in daily life in Saudi Arabian population to be established with more emphasis to the young adults.
- Medical students are in need for a positive role model and counseling from appropriate health professionals.

Conclusion

- The results of the study will help public health professionals and medical students to play an active role in the efforts to combat the obesity epidemic.

References

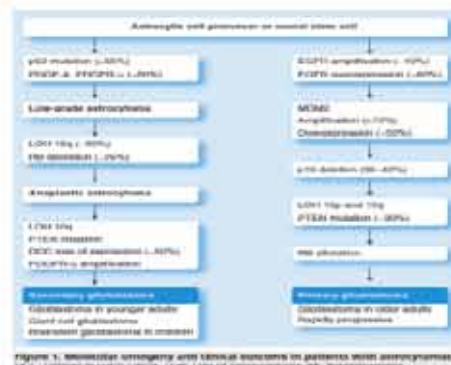
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Is Anaplastic Astrocytoma Different in Saudi Arabia?: A Single Center Experience

Deema Gashgarey, Malak Altewerki, Mohammed Alshehri, Sultan Alfadi,
Sara Alsaddique, Ayman Mohamed
College of Medicine, Alfaisal University

BACKGROUND

- Anaplastic astrocytoma is known as WHO grade III glioma that arises from astrocytes and requires more aggressive management.
- Studies suggest that the prevalence of AA in Saudi Arabia accounts 16% of all intracranial space occupying lesions.¹
- It is thought that several genetic mutations play an important role in the pathophysiology of AA.
- Due to the high consanguinity prevalence in the Saudi society, we hypothesize that genetic mutations leading to AA are more prevalent in KSA.

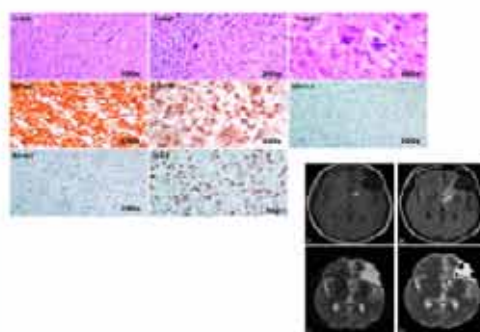


AIMS

- To characterize the relationship of the genotypes, phenotypes, risk factors, associations, prognostic factors, complications and long-term outcomes of this disease in our population.
- To determine the effectiveness of the treatment protocols followed at KFSH&RC for Saudis.

METHODS

- This is a retrospective cohort study where we will retrieve, review, and analyze the data of patients diagnosed and managed with AA at KFSH&RC from 1995-2015.
- The in-depth report would include clinical presentations, diagnostic approaches, genetic mutations, risk factors, complications, prognosis and patients' quality of life.
- Data will be entered in a specifically designed collection sheets for the detailed analysis.
- Results showing a p value of 0.05 will be considered significant and will be presented in the form of charts and tables.



REFERENCES

- [illegible]

Adolescent Perception of Obesity in Riyadh

Reem Alsuikhi, Thuraya Alhadi, M. Marwan Dahbigh, Ahlam Al Shedeekhy, Dileep Rohra, Abirali Senok

Background

Saudi Arabia is ranked 29th among 194 countries in prevalence of adult obesity. However, there is limited data on obesity among adolescents in the country.

Objectives

This study was carried out to determine prevalence and baseline knowledge of obesity, as well as assess self-perception of body image among adolescents in Rivadh.

Methodology

225 students aged 12-16 attending three randomly selected secondary schools in Riyadh had their weight/height measured and body mass index (BMI) calculated. They completed a questionnaire comprising of questions to assess knowledge of obesity and body image perceptions.

Results

- ❖ Majority of the students were females (68%) with mean age 14 years +SD1.25. Based on BMI scale for adolescents, 23.6% were overweight (equivalent to obese in adults) while 28% were classified as overweight risk.
- ❖ Most of the students knew the correct definition of obesity (73.8%) and that obesity was a risk factor for diabetes and cardiovascular disease (>90%).
- ❖ Fewer students (17-44%) identified obesity as a risk factor for various non-cardiovascular conditions. (fig. 1)
- ❖ About half of the students had poor body image self-perception and 75.3% would like to lose at least 2kg. Those with high BMIs believed they were heavier than they actually were.
- ❖ Multiple regression analysis shows that age and gender are significant predictors for BMI category.

Conclusion

Our findings indicate adequate knowledge about obesity in the study population. However, the high prevalence of obesity and poor body image self-perception is of concern.

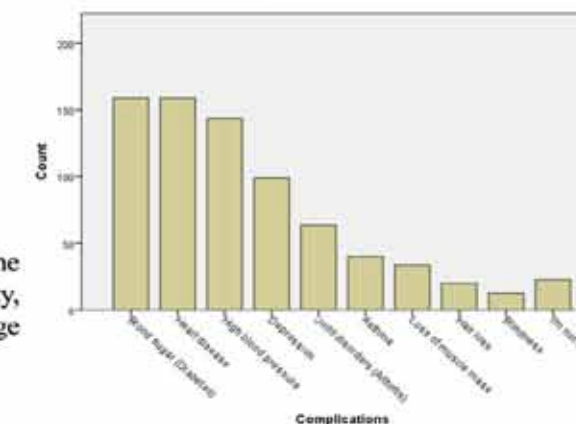


Figure 1: displays that most students knew obesity was a risk factor for cardiovascular diseases, however fewer identified obesity as a risk factor for non cardiovascular conditions

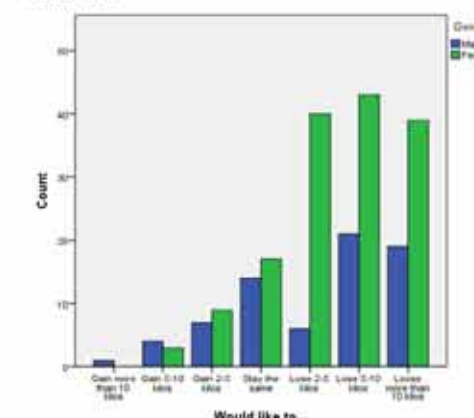


Figure 2: displays the amount of weight students would like to lose

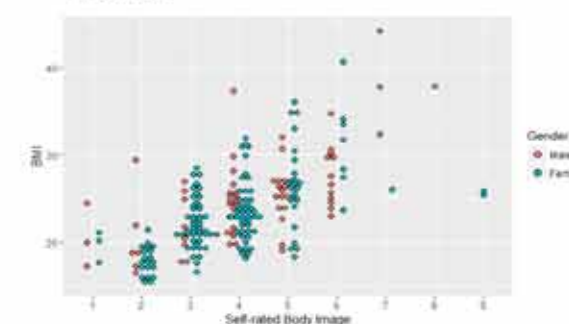


Figure 3: displays the correlation between gender, BMI and self-rated body image



Genetic variants in the ACP1 gene confers risk for cardiovascular disorders: an association study

Kamar Alhaffar¹, Paul Muiya², Rasha AlJelaifi³, Y.Reaf⁴, M.Najai¹, Nunzio Bottini⁴, Nduna Dzimiri³ and Coralie Poizat⁴

¹ College of Medicine, Alfaisal University.
² Cardiovascular Research Program, King Fahad Specialist Hospital & Research Centre.
³ Cardiovascular & Pharmacogenetics, King Fahad Specialist Hospital & Research Centre.
⁴ Division of Cellular Biology, La Jolla Institute for Allergy & Immunology, La Jolla, CA, USA

Introduction

Coronary artery diseases (CAD) are major causes of death in Saudi Arabia and are a huge economical burden. A number of studies linked genetic variants of candidate genes to CAD risk factors. Recently, few association studies have shown an association of the acid-phosphatase 1 (ACP1) genetic variants and the pathogenesis of CAD in a relatively small sample populations. ACP1 is a highly polymorphic gene encoding Low molecular weight tyrosine phosphatase (LMPTP). Two major isoforms ACP1 F and ACP1 S resulting from alternative splicing give rise to two protein isoforms. Single-nucleotide polymorphisms (SNP) in the coding region of ACP1, have been connected with several disorders including asthma, Alzheimer's disease and obesity. However, the role of non-coding regions which are emerging as important regulatory regions, have been overlooked. In this study, we examine genetic variations across the ACP1 locus in a Saudi cohort of 5115 individuals harboring CAD risk traits including atherosclerosis, myocardial infarction, hypertension, type 2 diabetes (T2DM), obesity and dyslipidemia.

Methodology

1. Screening for variants/SNPs by direct sequencing of 100 Patients.
2. Genotyping to screen the 5015 patients for ACP1 SNPs using the Taqman ABI Prism 7900HT Sequence Detection System.
3. Use of SPSS statistical program to analysis of Variance by (ANOVA) or Student's test.

Results

Sequencing led to the identification of 16 variants of potential interest, the majority of which reside in non-coding regions of the ACP1 gene.

	Control			CAD Cases		
	All	Male	Female	All	Male	Female
MI	1765	872(49.4)	893(50.6)	3350	2469(73.7)	881(26.3)
Age	47.1 ± 0.4	47.2 ± 0.6	47.1 ± 0.4	59.73 ± 2.2	59.3 ± 0.2	60.8 ± 0.4
BMI	28.9 ± 0.3	29.9 ± 0.3	30.0 ± 0.3	29.3 ± 0.1	28.2 ± 0.1	31.4 ± 0.3
CAD	2482	1224(52.8)	1158(46.7)	2623	2017(76.4)	618(23.4)
OBES	3189	2256(72.6)	853(27.4)	2006	1085(54.1)	921(45.9)
T2DM	2273	1444(63.5)	829(36.5)	2842	1897(66.7)	945(33.3)
HTN	1075	698(64.9)	377(35.1)	4040	2643(65.4)	1397(34.6)
LDL-C	4338	2842(65.5)	1496(34.5)	669	431(64.4)	238(35.6)
HDL-C	2828	1611(57.0)	1217(43.0)	2182	1665(76.3)	517(23.7)
HTG	3749	2380(63.5)	1369(36.5)	1271	903(71.0)	368(29.0)

Table1 The numbers in brackets give the percentages of the total values of the group. CAD, BMI, body mass index; LDL-C, low density lipoprotein-cholesterol; HDL-C, high density lipoprotein-cholesterol level; HTG, hypertriglyceridemia; HTN, hypertension; T2DM, type 2 diabetes mellitus; OBES, obesity.

* This work was supported by grant 10-BIO 1347-20 from King Abdulaziz City for Science and Technology.

Results (Cont.)

Table2. Association of ACP1 with cardiovascular disease

		Univariate Analysis		Multivariate Analysis	
Trait/Variant	Control n	Cases B(95%CI)	P-value	B(95% CI)	P-value
Low High density lipoprotein					
T	0.137	0.159 1.19(1.06-1.33)	0.004*	1.20(1.07-1.36)	0.003*
rs10167552_CT	CT+TT 0.252	0.289 1.21(1.06-1.37)	0.005*	1.42(1.25-1.63)	0.004*
rs12714402_GA	A	0.491 0.513 1.09(1.01-1.19)	0.029	1.11(1.02-1.21)	0.018
G	0.129	0.151 1.20(1.07-1.35)	0.002*	1.23(1.09-1.40)	0.001**
rs12714402_GA	GG	0.239 0.277 1.22(1.07-1.39)	0.003*	1.25(1.09-1.44)	0.001**
Obesity					
B	0.452	0.517 1.13(1.02-1.20)	0.020	1.11(1.02-1.21)	0.015
rs12714401_AG	GG	0.728 0.758 1.17(1.02-1.35)	0.023	1.17(1.02-1.36)	0.019
rs12714402_GA	AA	0.726 0.757 1.17(1.07-1.29)	0.001*	1.19(1.04-1.36)	0.014
rs12714403_GA	GA+AA 0.735	0.760 1.14(1.04-1.25)	0.007*	1.18(1.03-1.35)	0.021
rs4447635_GG	GG	0.07 0.09 1.19(1.03-1.38)	0.022	1.23(0.99-1.53)	0.060
Coronary Artery Disease					
rs7584915_GA	AA	0.032 0.0410.78(0.65-0.93)	0.012*	0.74(0.55-1.00)	0.048*

Table2. The variants associated with obesity (2000 cases vs 3109 controls), low high density lipoprotein (2182 vs 2828) and coronary artery disease (2633 vs 2482) among the 5115 studied individuals before and following adjustments for the influences of other risks factors. B, Coefficient; C.I., confidence interval; *P<0.01; **P<0.001

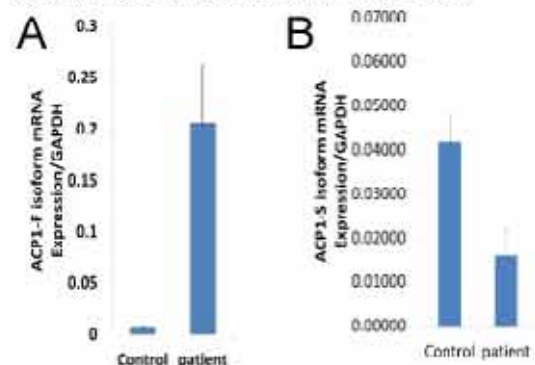


Figure 1: mRNA expression of LMPTP isoforms in CAD and CAD-free patients. A. LMPTP F isoform expression against GAPDH in 5 CAD patients and 5 controls showing a significant expression of the enzyme in CAD patients vs. controls. B. LMPTP S isoform expression against GAPDH in 5 CAD patients and 5 controls showing decreases by more than 2 folds in CAD patients.

Conclusion

Our results revealed a novel SNP in ACP1 promoter region that showed a protective association with coronary artery disease. In addition 4 SNPs showed significant association of with obesity and low level HDL. Observing the expression of the enzyme in blood level showed increased expression of ACP1-F isoform in CAD patients compared to CAD-free individuals while ACP1-S isoform was reduced.

Future Directions

Further investigation of LMPTP isoforms pathway is important to understand its role on the molecular level.

ACP1 SNPs can be a potential diagnostic parameter to detect susceptibility to CAD and other CAD traits in the future.

Smoking and its Effect on Parkinson's Disease



Sara Ahmed Alsaddique
College of Medicine, Alfaisal University

7th Scientific & Research - Medicine and Health Sciences



Background

- The symptoms of Parkinson's Disease (PD) are due to the neurodegeneration of the nigrostriatal dopaminergic pathway, other receptors like the nicotinic cholinergic system are also involved.
- Studies have shown that smoking could ameliorate the symptoms of Parkinson's disease (Neuroprotective). This project will examine the effect of tobacco smoking on these patients since quite a number of them smoke.
- That is not to say that we condone smoking as such.
- This study can also help in finding the main pathology of Parkinson's from the effect of tobacco and its chemical components.
- Studies revealed that smokers are 46% less likely to develop Parkinson's than people who had never smoked.

Methods

- This study will focus on how nicotine and cigarette components could affect PD patients.
- Follow-up patients who have been diagnosed with PD for years. A prospective chart review by evaluating patients' data and all patients who have been diagnosed with PD in KFSH to fill out the answers to present questions.
- The study will focus on a specific PD patient's sample and comparing them by age, time of diagnosis, gender, packs of cigarettes per year or shisha heads per year, Hoehn and Yahr scale and Levodopa dose equivalent per day.

Aims

- To have a closer look at the relationship between the pathophysiology of Parkinson's Disease and Tobacco smoking.
- To further examine the impact of smoking on PD by comparing cohorts of smokers and non-smokers patients.
- This is only an effort to stimulate further work in order to isolate the substance responsible for the beneficial effect on PD.

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Science & Humanities



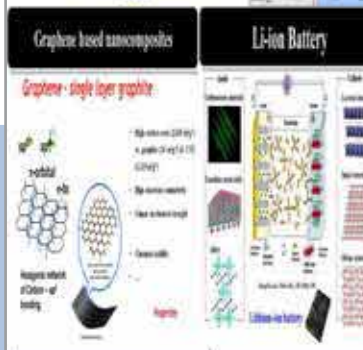
Novel synthesis of Holy Reduced Graphene Oxide/polystyrene nanocomposites by microwave irradiation method for cathode in lithium-ion batteries

Yazeed Aldawsari, Faheem Ahmed, Edreese H. Alsharaeh*

I. Introduction

Polystyrene: A synthetic aromatic polymer made from the monomer styrene. It is one of the form of plastic production. Its been used in food packaging, toys, and electronics and many other applications.

Electrochemistry: uses the reduction (cathode which has the ability to accept electrons) and the oxidation reactions (anode which has the ability to give electrons)
For example:



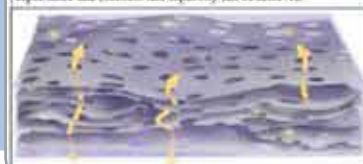
II. Experimental details

A. Preparation of HRGO using Ag NPs:



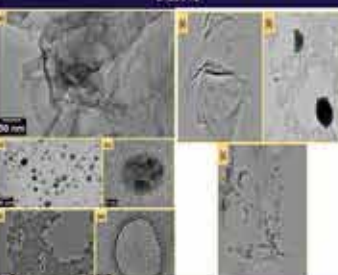
Why Holy Graphene as an anode for Li-ion battery?

- Nanopores in HRGO sheets are large enough to function as the ion diffusion shortcuts between different layers of graphene to greatly speed up the ion transport across the entire film and facilitate ion access to the entire surface area, which is not possible with non-hole graphene.
- High volumetric capacitance while retaining high gravimetric capacitance and excellent rate capability can be achieved.

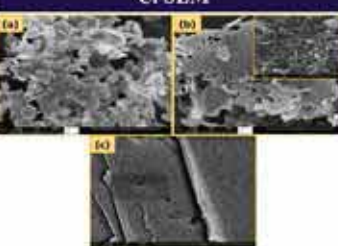


III. Results and discussion

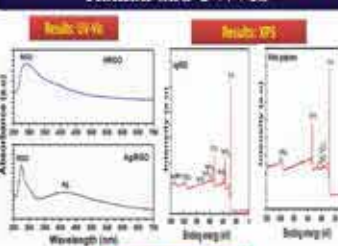
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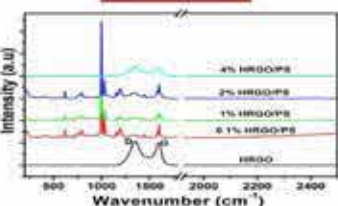
C. SEM



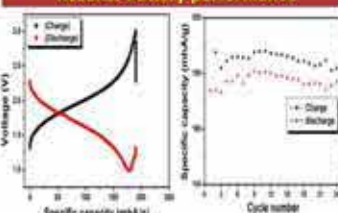
Raman and UV/VIS



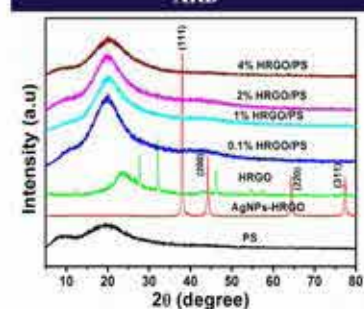
Results: Raman



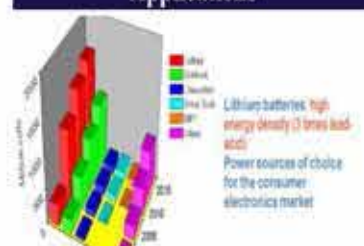
Results: Battery performance



XRD



Applications



IV. Conclusion

- XRD, Raman, UV, XPS and morphological characterization confirmed the successful removal of Ag nanoparticles in Ag/HRGO product, which then finally resulted to unique HRGO structure.
- A good electrochemical response in terms of charge/discharge capacity, rate capability, cyclic performance, and columbic efficiency was observed.
- This research will open up a new direction on the potential applications of HRGO with their conductive nature of and their porous structure to be used as advanced electrode materials in energy storage applications.

V. Acknowledgement

This study is a part of senior research project at the college of Science and General Studies. The authors gratefully acknowledge the continued support from Alfaisal University and its office of research.

Fabrication of Metal Oxide/Reduced Graphene Oxide Nanocomposites for Anode in Li-ion Batteries

Yasmin Mussa¹, Faheem Ahmed¹, Mohammad Alshahrani², Hatem Abuhim², Edreese Alsharaeh^{1*}

¹Dept. of chemistry, College of Science & General Studies, Alfaisal University, Riyadh, Saudi Arabia.

²National Nanotechnology Research Center, King Abdulaziz City for Science and Technology, Riyadh, Saudi Arabia

1. Introduction

Lithium-ion batteries are promising storage devices for a wide range of applications.



Can we use them as storage devices for more complex applications?

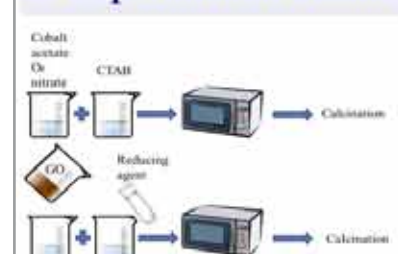


The challenge is to develop materials that store more energy and deliver higher power for longer duration of time, get charged in shorter period of time, have a longer life-time and be resistant to fire hazards.

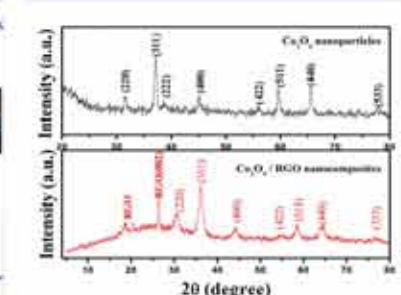


The performance of lithium-ion batteries is highly dependent on the cathode or anode. Here, we developed a nanomaterial as anode for lithium-ion batteries.

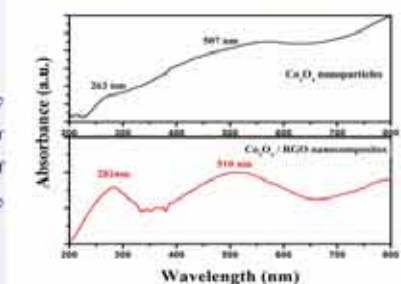
2. Experimental details



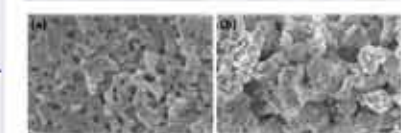
3. Results & discussion



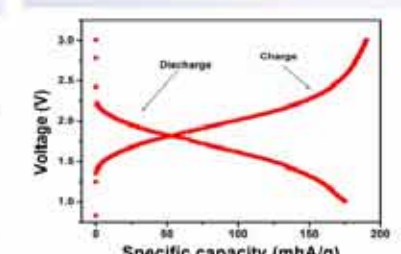
XRD pattern of Co₃O₄ nanoparticles and Co₃O₄/RGO nanocomposites (8%RGO).



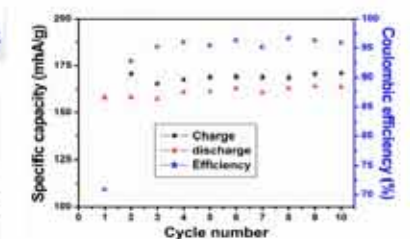
UV-Vis absorption spectra of Co₃O₄ nanoparticles and Co₃O₄/RGO nanocomposites (8%RGO).



FESEM images of (a) Co₃O₄ nanoparticles, and (b) Co₃O₄/RGO nanocomposites (8%RGO).



Initial galvanostatic charge/discharge curves for Co₃O₄/RGO nanocomposites obtained at a current density of 1 mA/g.



Cyclic performance and Coulombic efficiency obtained at a current density of 1 mA/g for

4. Conclusion

In summary, Co₃O₄/RGO nanocomposites (8% RGO) were successfully prepared using microwave assisted solution method.

XRD, UV-Vis and Raman results show that the prepared nanocomposites containing highly crystalline Co₃O₄ nanoparticles and RGO sheets.

Morphological studies show nanoporous structure Co₃O₄ supported on RGO sheets.

The nanocomposites prepared by MWI shows remarkable properties as a good anode material for LIBs.

A good electrochemical response in terms of charge/discharge capacity, cyclic performance, and columbic efficiency was observed.

This excellent performance could be attributed to the formation of 2D RGO framework decorated with Co₃O₄ nanoparticles.

5. Acknowledgements

This study is a part of senior research project at the college of Science and General Studies. The authors gratefully acknowledge the continued support from Alfaisal University and its office of research.

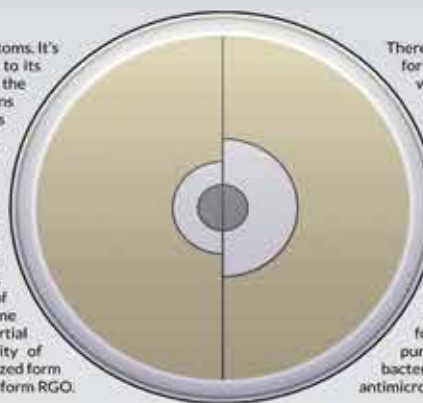
UG-S01Alrawaf 2016

A Comparative Study of Antibacterial Properties of Silver Nanoparticles / Reduced Graphene Oxide (RGO) and Silver Nanoparticles / Commercial Reduced Graphene Oxide (cRGO) Nanocomposites: Role of Silver Nanoparticles

Tarfah Alrawaf, Khaled Al Saud, Mohammed AlHindawi, Yazeed AlDosari
Faheem Ahmed, Edrees H. Alsharaeh*

Background:

Graphene is a single layer of carbon atoms. It's an excellent electron conductor due to its extraordinary high quality of the graphene lattice. Since the electrons are not scattered by the imperfections of the lattice they can go through very fast. This is because of the very strong, yet flexible bonds of carbon atoms. Making it bendable, yet harder than diamond. To transfer these extraordinary properties of graphene to real applications one of the most promising means for getting graphene in large amounts is the oxidation-reduction process of graphite. Reduction of the Graphene oxide (GO) sheets leads to a partial recovery of the original conductivity of graphene. Graphene Oxide is an oxidized form of Graphene and it can be reduced to form RGO.



There are multiple ways to functionalize RGO for use in different applications, one of which is adding silver nanoparticles (AgNP). It has been well known that silver ions and silver based compounds have strong antimicrobial effects for many centuries. Microbes are found everywhere and are becoming even more dangerous because the number of antibiotic resistant microbes is increasing. In this study AgNP are being used to combat the spread of microbes. We show a comparative study between AgNP/cRGO and AgNP/RGO. We compared the antimicrobial properties of both and found that the functionalized RGO with pure AgNP against the Gram negative bacteria Escherichia coli proves to be a better antimicrobial material.

Experimental Procedure:



The synthesis of the silver nanoparticles was performed using commercial graphene with different percentages of AgNO₃. The solution was reduced in a conventional microwave oven, after treating it with Hydrazine Hydrate.

Results:

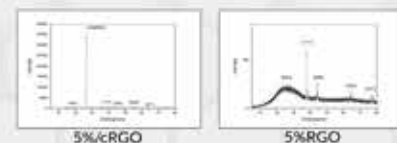
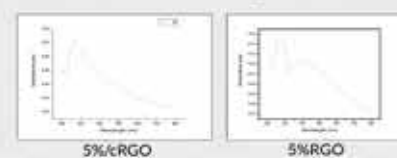
TEM: The size and morphology of AgNPs with RGO and with cRGO were examined by transmission electron microscope.



Antimicrobial properties against the Gram negative bacteria Escherichia coli using colony inhibition.



UV-Vis: The UV-Vis and XRD were employed to determine the formation of AgNP.



Conclusion and Future Work:

This work demonstrates that Silver with reduced graphene oxide shows better synergy than with commercial graphene. This is due to the hydroxyl, epoxy, carboxyl and carbonyl groups on the graphene oxide, which make great anchoring sites for the silver and improve the creation of functionalized nanoparticles. Reduced graphene oxide alone is not antimicrobial, but with the addition of silver it shows high antimicrobial activities. A small percentage of silver (5%) with reduced graphene gives equal antimicrobial activity as 100% silver. These results reveal that RGO/Ag nanocomposites as a form of antibacterial material have a great promise for application in a wide range of biomedical functions. Future work includes further work on RGO with silver. More specifically working on the effects of different sizes and shapes of Silver nanoparticles on the antimicrobial activity.

UG-S02-AISaaidoun2016

Green Synthesis Of Silver Nanoparticles/Reduced Graphene Oxide Nanocomposites For Potential Anticancer Nanotherapy

Joud AlSaadoun, Nouf Bin Ghith, Sarah Alazzam, Faheem Ahmed, Edrees H. Alsharaeh*

I. Introduction

- Cancer is considered to be one of the leading causes of morbidity and mortality worldwide.
- Chemical cytotoxicity is a vital part of our research, where we check the quality of a substance of being toxic to a cell.
- Nanotechnology is used in medicine.
- Nanotechnology has been found to produce developmental breakthroughs in the cancer field.
- Ag NPs possess anticancer effect.
- Cancer therapy which is silver nanoparticle-based used as a therapy to kill cancer cells or tumor tissue.
- It could assist in detecting, diagnosing, and treating various forms of cancer.
- Using nanoparticles is more effective than radiation therapy. It causes less harm to healthy cells.
- Metal nanoparticles are toxic which limit their biomedical applications.
- The presence of GO lowers the content of the toxic metals and maintains anticancer effects.
- Our aim: produce a nanocomposite with lower metal content and good anticancer performance.

II. Experimental Details

A. Preparation of Ag NPs and Ag-RGO NPs using Silver Nitrate Salt as precursor

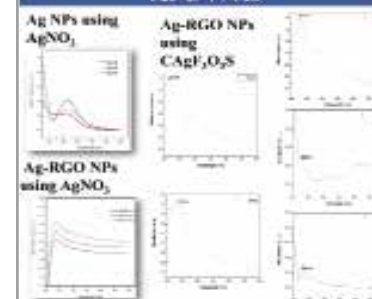


B. Preparation of Ag NPs and Ag-RGO NPs using Silver trifluoromethanesulfonate



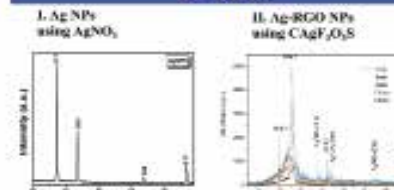
III. Results and Discussion

A. UV-Vis



- Optical properties were investigated using UV-Vis spectroscopy for the NPs using different precursors.
- For Ag NPs, the peak in the range of 300-400nm indicates the presence of Ag NPs.
- For the Ag-RGO NPs prepared using different precursors, the peak around 270nm indicates the presence of graphene.

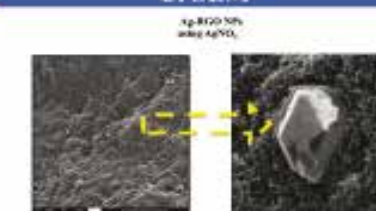
B. XRD



XRD Pattern for I. Ag NPs using AgNO₃, II. Ag-RGO NPs using CAgF₃O₅S

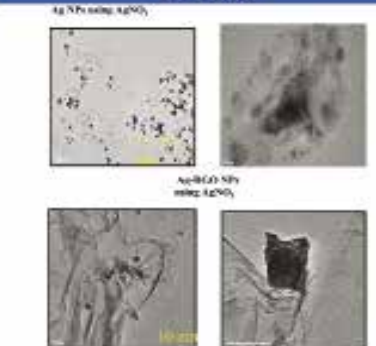
- XRD analysis was done to study the crystal phase of the Ag NPs using different precursors.
- The diffraction peaks of the Ag NPs are similar to those of pure Ag NPs.
- No other peaks of impurity were detected which shows the high purity and crystallinity of the NPs.

C. SEM



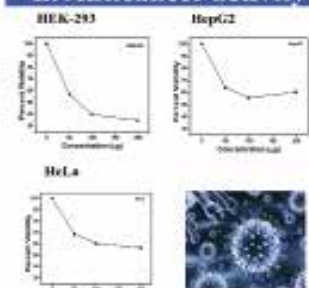
- Here, the SEM image of the Ag-RGO NPs was used to investigate the structure of the NPs.
- Ag NPs supported on graphene are evident.

D. TEM



- The structure of the NPs was investigated using high resolution by the TEM.
- For Ag NPs, Ag NPs of spherical shapes are clear.
- For Ag-RGO NPs, Ag NPs supported on graphene are evident.

E. Anticancer activity



- AgNPs/RGO nanocomposites is more efficient in inhibiting cell proliferation for all kind of cancer cells.
- The samples were more efficient against human cancer HEK-293 (Kidney) cell lines.

IV. Conclusion

- Microwave irradiation provides a rapid method for the synthesis of Ag nanoparticles.
- Advantage of this nanocomposite with low nanomaterials content will reduce the risk of excessive Ag usage, which makes it safe material for use in many applications.
- We confirmed the success of our Nanomaterials using XRD, TEM, SEM and UV-Vis.
- XRD studied the crystal phase of our nanomaterials and the results showed nanomaterials of high crystallinity and purity.
- We studied the structure of our nanomaterials through TEM and SEM both of them showed clear images of Ag NPs and Ag NPs supported on Graphene sheets.
- For the UV-Vis, The peak between 300nm and 500nm indicates the presence of Ag NPs and the peak around 270nm confirms the presence of Graphene.
- The aim of this work is to treat 3 types of cancer.
- After concluding this study on the three types of cancer cells, we are hopeful for the same or better results when applying NPs on different kinds of cancer cells.

V. Future Work

- The properties of Nanomaterials are dependent on size, shape and surface area.
- In this work my goal is to study:
 - The effect of different precursor.
 - The effect of different percentage of Graphene.
 - The effect of different concentrations.
- And to apply it to the area of cancer therapy.
- Currently I'm working on other 3 types of cancer which I'm aiming to investigate them deeply.

VI. Acknowledgement

This study is a part of senior research project at the college of Science and General Studies. The authors gratefully acknowledge the continued support from Alfaisal University and its office of research.

UG-S05-AIMubarak 2016

Screening for Common Blood and Clotting Disorder Mutations in Randomized Samples.

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¹College of Science and Health Studies (KFSH&RC), ²Saudi Human Genome Project, ³Department of Molecular Genetics, ⁴Department of Hematology, ⁵Department of Pathology, ⁶Department of Microbiology, ⁷Department of Immunology, ⁸Department of Pediatrics, ⁹Department of Obstetrics and Gynecology, ¹⁰Department of Radiology

Introduction

Since antiquity, blood has been revered as the life force of man and animal. Disorders of the blood have been documented since the 2nd Century CE. These disorders can have implications as simple as a treatable nutrient deficiency or as severe as fatal bleeding brought on by minor injuries. These disorders are usually genetic in nature, and these disorders are fairly common amongst Saudis due to high consanguinity rates. Early treatment and prevention of these disorders relies heavily on early detection of causative mutations, using Whole Genome or Whole Exome Sequencing is neither time nor cost efficient. The modern boom in biotechnology has presented a candidate solution to this in the form of Targeted Next Generation sequencing using disease type-specific gene panels.

Objectives

In this pilot study we aim to:

- Look into the common blood and clotting disorders affecting randomized samples of the Saudi population utilizing a customized Gene Panel, property of the Saudi Human Genome Project.
- Determine specificity and sensitivity of the platform and its effectiveness as a high throughput mutation detection technique.
- The study will also look into common causative genes in specific diseases such as Hemophilia, and Glanzmann Thrombasthenia to identify common variants in these genes in the Saudi population.

Results:

- The 152 samples were divided into 2 groups: Group I and Group II.
- First, we visited the system's specificity in both groups:
 - Group I: consisted of 70 cases- some of which have a clinically confirmed blood disorder- 1 of those was free of mutations, 3 were problematic, the remaining 66 were validated and closed.
 - Group II: consisted of 82 cases- some of the cases have blood disorders but information on the specific clinical diagnosis is not available- 68 of those have been closed and the 14 problematic cases remaining are being re-processed and re-evaluated. The results of the system specificity (i.e. the platform's variant detection accuracy) for Group I and II are summarized in (Figure 3).
- Second, the clinical sensitivity visited for Group I.
- 11 cases showed mutations in the ITGA2B gene, known to be implicated in Glanzmann Thrombasthenia. Clinical data confirmed those patients to be affected by the disease.
- Another 9 showed mutations in the ITGB3 gene, also known to be implicated in Glanzmann Thrombasthenia. Clinical data confirmed the affected status of those patients.
- Another patient's clinical data reported a potential disease of sorts. TNGS confirmed this showing that the patient possibly suffers from macrothrombocytopenia.

Special case study:

When the clinical diagnosis of the patients was revealed, a patient with a reported case of Von Willebrand Disease (VWD) possessing no changes in the VWF gene, the gene usually implicated in VWD. Upon further investigation into the mutational analysis of the patient in question was carrying a mutation in the gene HSP5, a gene known to be implicated in Hermansky-Pudlak Syndrome. Implications associated with the syndrome include a decrease in von Willebrand factor, which could explain why the patient was diagnosed with VWD.

This presents a possible application in the correction of clinical diagnosis. Further investigation will be performed to confirm the validity of this case.

Conclusion

The Heme Gene panel is an efficient tool for detecting point mutations as demonstrated by the high specificity (78%) and clinical sensitivity was found to be over 59% accurate in the Group I cases.

Acknowledgments

From the department of Genetics at KFSH&RC:
Behavioral Genetics Unit
Saudi Human Genome Project.
Sequencing Core Facility at KFSH&RC
KACST
Department of Pathology at KFSH&RC

Patients and Methods:

- A total of 152 random consenting individuals from different parts of the Kingdom were recruited in this study after obtaining informed consent
- DNA extracted from whole blood was sequenced using IonTorrent Heme Gene Panel comprising of 393 genes that have been previously implicated blood/clotting disorders (Figure 1).
- Data analysis was performed (blinded to the disease status) using a multi-step in house filtering method illustrated in (Figure 2).
- Candidate genetic changes were verified by direct sequencing (Sanger) using primers designed to amplify the region harboring the change. Example candidate genes are listed in (Table1)

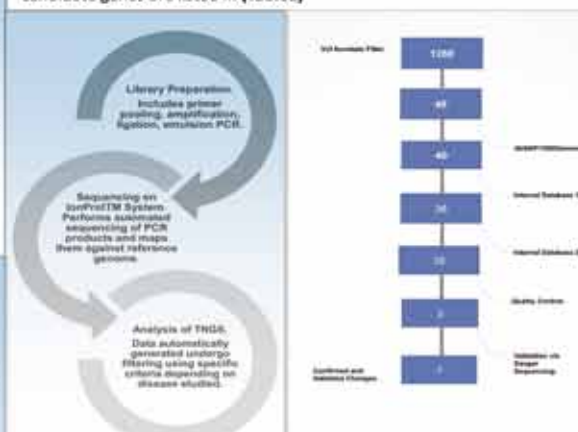


Figure 1: General scheme for TNGS sample processing (including Heme Gene Panel) Figure 2: Filtration method applied in this study

Examples of Genes Selected for Investigation					
ACTN1	ERCC2	GNAS	LRP5	RPL5	TERF2P
ADAMTS13	F2	GP1BA	LYST	RPS24	TET2
AMN	F2R	GP5	MAN2B1	RTEL1	THBS1
ANKRD26	F8	HES1	MUC5B	SERPINA1	TNFRSF1
ASXL1	FANCA	HMBS	NBN	SERPINC1	TNKS1BP
C21orf33	FANCB	HMOX1	NOS3	SERPINE1	TPH1
CDAN1	FANCG	IRF1	PLA2G7	SLC4A1	USP1
COL1A1	FASN	IRF8	PLAUR	SPTA1	VPS13B
CSF3	FERMT3	ITGA2	PNP	SPTB	VWF
CUBN	FGB	ITGA2B	POT1	STXBP2	WDR19
CXCL12	FLT1	ITGB3	RAD50	TCIRG1	WRAP53

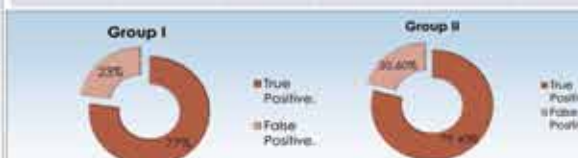


Figure 3: Illustrations of the system's specificity cases in both groups. The percentages represent the cases that were detected then verified via Sanger Sequencing. The charts show that the results obtained are consistent with one another.



Figure 4: Clinical sensitivity. Match denotes the samples with matching clinical data and genetic finding. Mismatch denotes samples in which the genetic findings differ from the clinical information

UG-S07-AI-Shalaan 2016

Profiling of Stem Cell Marker in Fascin knockout Mice

Aeshah Ahmed Al-Shalaan

Dr. Monther Ali-Alwan* Ms. Rayyanah Barnawi

BACKGROUND:

Fascin is a 55 kDa actin-binding protein. It has been shown to be a key regulator of cell motility and invasion. Also, it has been identified to be expressed by a restricted number of cell types during the course of life. Induced expression of fascin has been identified in many tumors including, colon, ovarian, lung and breast cancer. The level of fascin expression in many cancers directly correlated with bad prognostic markers, chemoresistance, metastasis and increased mortality. Recently, our lab has shown that fascin regulate breast cancer stem cells. The biological function of fascin during normal development has not been thoroughly investigated. Future researches regarding this matter will possibly give clearer vision of how this protein can be beneficial.

RATIONAL:

Our lab showed that fascin regulates breast cancer chemoresistance and metastasis, which are responsible for increase tumor-related mortality. More recently, fascin was shown to regulate breast cancer stem cells. Fascin function in cancer has been extensively studied, but its physiological role during normal development has not been investigated.

HYPOTHESIS:

Fascin expression during in normal tissues is required for stem cell development.

OBJECTIVES:

To use a fascin knockout mouse model to address and identify the biological function of fascin during development using a knockout mouse model. The specific aim will be to test the effect of fascin loss during development on stem cells from different tissues by measuring the pluripotent transcriptional factors.

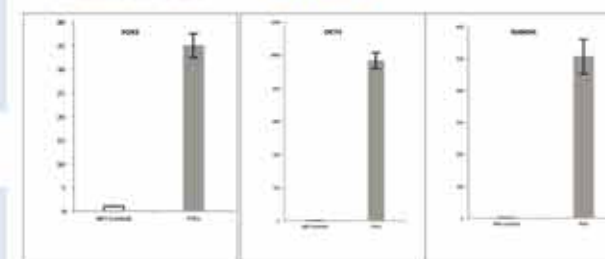
METHODOLOGY:

- Bone marrow, thymus, spleen and breast were collected from fascin^{+/+} (wild type), fascin^{+/-} (heterozygous) and fascin^{-/-} (homozygous) mice.
- Induced Pluripotent Stem Cells (iPSCs) were generated from mouse embryonic fibroblasts (MEF) by transfection with the Yamanaka four embryonic stem cell (ESC) transcriptional factors (Oct4, Sox2, Nanog, Klf4). The iPSCs were used as a positive control in our assay for the ESC transcriptional factors.
- Single cell suspensions were prepared from each tissue or iPSCs.
- Predefined Taqman probes for each genes were used.
- Gene expression was measured using Real-Time PCR on ABI-7500.

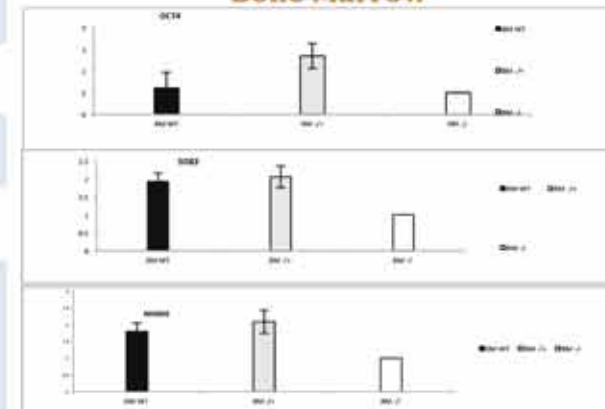
CONCLUSION:

Fascin regulates ESC pluripotent transcriptional factors in the bone marrow and breast. Fascin is required for transition from basal to luminal lineages (decreased Gata3, Stat3). Overall, fascin is a key regulator of stem cells during development.

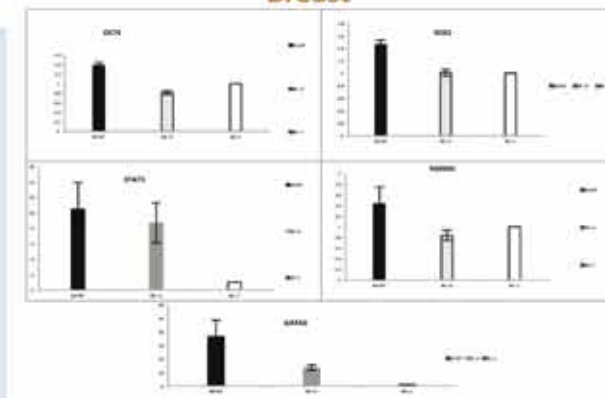
RESULTS: iPSCs



Bone Marrow



Breast



UG-S08- AlGubllan 2016

The Role of Obesity in The Activation of Breast Stromal Fibroblasts

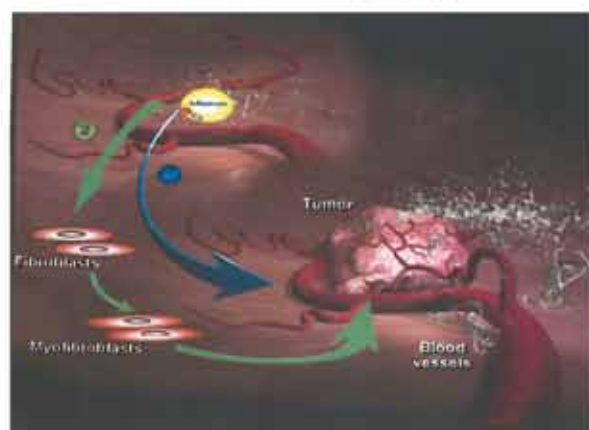
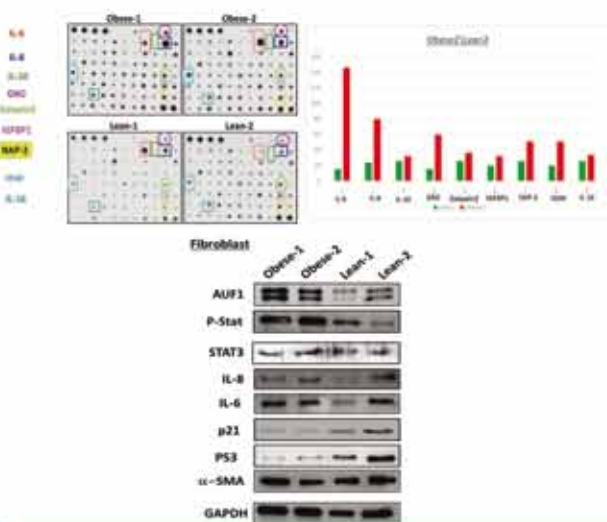
Sarah Hamad AlGubllan, Dr. Huda Alkhalaf

Introduction

The worldwide increase in obesity including in Saudi Arabia reached epidemic proportions, and has been recently recognized as a disease. Epidemiological studies have associated obesity with increased risk for various chronic diseases such as cancer. The connection between obesity and breast cancer is affected by the cellular components of the stromal tissue in the female breast. An obese person is someone who's not healthy and has abnormally high and unhealthy proportion of fat in their body and consequently, high number of adipocytes. Tumor stromal tissue contains fibroblasts that are converted into active fibroblasts when cancer is developed. In this study, we sought to investigate the effect of obesity, which is accompanied by increased number of breast stromal adipocytes from obese women on stromal fibroblasts. The research was conducted using fibroblasts derived from obese and lean normal female breast tissue underwent breast plastic surgery. We have shown that fibroblasts from obese women are active, have higher migration/invasion and proliferation capabilities, and secret higher levels of various cytokines as compared to those derived from lean ones.

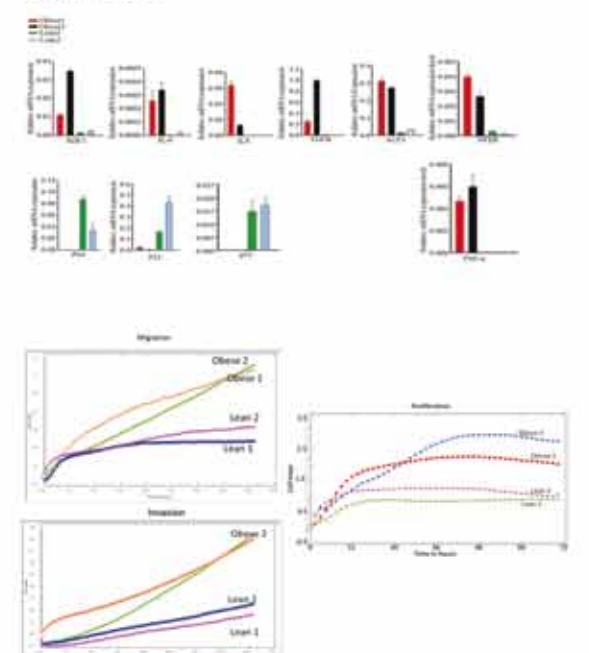
Objectives

Developing preventive as well as therapeutic strategies not only for breast cancer but also for other obesity-related tumors.



Experimental Procedures

- Cells and cell culture
- Immunoblotting
- PCR
- ELISA
- Conditioned Media
- Invasion Migration Proliferation Assay
- Cytokine Array



UG-S09-AlBathi 2016

Proteomic Analysis and Drug Delivery of Colorectal Cancer: Identification of biomarkers and targeted drug delivery using liposomes nanoparticles

Rahaf Saleh Al-Bathi, Kholoud Al-Amoudi, Zakia Shinawari, Niveen Khashab*, Ayodele Alaiya*

Introduction:

Colorectal cancer (CRC) has been the second common cancer among men and the fourth commonest among women since 2012 in Saudi Arabia (Oncology Center Research Unit, KFSHRC, Tumor Registry Annual Report 2013). Therefore, developing an early detection and targeted treatment approach may offer potential cure for the disease and save human lives. Identification and quantification of the expressed proteins in cells are among greatest challenges in the post-genomic era.

Aim:

This project aims to analyze global protein expression patterns from patients diagnosed with colon cancer using a combination of proteomic techniques. The used techniques are of clinical importance to improve the diagnosis and management of colorectal cancer patients. In addition, pH sensitive liposomal drug delivery system was used and successfully targeted colorectal cancer cell line HCT-116. This could be further functionalized to target specific biomarkers.

Methodology:

Proteomic analysis:

Twenty fresh -frozen tumor tissues were collected from patients at KFSH&RC. Samples were divided into four groups; group 1, patients with good prognosis, group2, patients with poor prognosis, group 3 patients without lymph node metastasis, and group 4, patients with positive node metastasis. The analysis of global protein expression patterns from the patients by using proteomics techniques including fluorescent differential two-dimensional gel electrophoresis and high definition liquid chromatography tandem mass spectrometry.

Liposomes preparation and drug delivery:

Generating pH sensitive liposomes nano-carriers with the following techniques; the nanoparticles suspension was prepared by a mixture of DPPC, DOPE-PAA and cholesterol. First, the solvent was removed to form a homogeneous lipid film. The anti-cancer drug (Doxorubicin) was passively loaded inside the liposomes. This was followed by freeze- thaw cycles and sonication. Nanoparticles suspension was then extruded with 100 nm membrane, followed by the removal of free Dox using G50 column. Characterization and release studies have been performed by zetasizer, fluorescent meter and confocal microscopy.

Results:

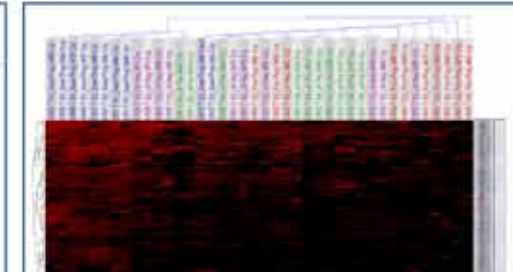


Fig 1. Unsupervised Hierarchical cluster analysis of 110 differentially expressed protein spots of four different groups of patient samples. Many of the samples with negative lymph node spread clusters shown to be relatively similar to the good prognosis samples.



Fig 2. Size distribution and zeta potential of pH sensitive liposomes. The average diameter considered for this sample was given by the volume distribution of a peak 151.5 nm for the size and -1.80 mV for the potential.

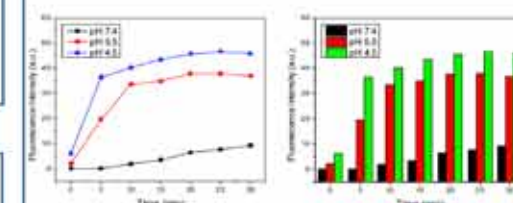


Fig 3. The kinetics of DOX release from the liposomes obtained with fluorescence meter at different pH values (pH4.5, 5.5, and 7.4). The highest release obtained in the lowest pH.

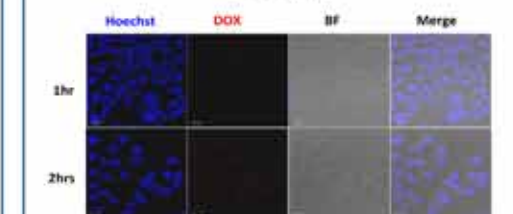


Fig 4. Confocal images for Dox loaded liposomes incubated with HCT-116 cells at different time points. The cellular uptake of the anionic liposomes showed clearly inside the cells within 2 hours.

Acknowledgment :

Proteomics Unit, Stem Cell and Tissue Re-Engineering Program, KFSH&RC. And Smart Hybrid Materials, Advanced Membranes and Porous Materials (AMPMC), KAUST.

3rd Prize Winner



Poster Competition 2016

