Session Reports: Health

Oral Session 1-A

Discussant and Author: Fatme Al Anouti

This session was led by Feres Mocaya Maron from the University of Cuyo, Argentina, who presented about his work on hypertensive disease model using mice. The talk was entitled "Oxidative Markers in a Rat Model of Hypertensive Disease". Hypertension is related to the renin-angiotensin system over-activation of brainstem centers and neural inflammation. Spontaneously hypertensive rats (SHR) offer an excellent model of hypertension, to explore the potential protective effect of the endocannabinoid anandamide (AEA) which had been shown to confer protection against nero-inflammatory damage.

The focus of Feres' research is to evaluate the role of nano-formulated anandamide in reducing blood pressure and inflammation in the central nervous system. His data demonstrated that AEA not only decreased systolic blood pressure significantly, but also reduced inflammatory markers and oxidative stress markers (NADPH oxidase and nitrites) in brain cortex. These interesting and promising results regarding antihypertensive and anti-inflammatory properties of AEA could open the door for the use of nano-formulated canna-binoid in the regulation of inflammation during hypertension.

This research is very important and beneficial given the wide prevalence of hypertension and the association with cardio-vascular diseases. It is worth mentioning that Feres Mocayar received an award at WCUR 2019 for his outstanding research investigation.

Oral Session 1-B

Discussant and Author: Karina Karolina De Santis

Oral Session 1 of the conference included two presentations by students from Australia and the USA. The students reported the outcomes of studies regarding the association between victimisation and the appearance anxiety in adolescents in Australia (Leah Henderson) and the development of intercultural competency in allied health students in the USA (Linnea Carlyle and Sarah Hagar).

Both presentations shared the methodological aspects, including the mode of data collection (online surveys) and the statistical approach to testing relationships and comparing group differences.

Both presentations suggest that culture and demographic characteristics (age, gender) play an important role in the perception of self and others. The general discussion focused on three issues:

1. Recommendations for teachers and parents to address the issue of body perception equally in adolescent girls and boys.

2. Intercultural competency as an important soft-skill in allied health education and in the general university education.

3. The conflicting role of the social media in promoting the false perception of body image or the cultural misconceptions while concurrently providing an easy access to potential research participants and facilitating an intercultural exchange without having to leave the own home.

I found the take-home messages clear and thought-provoking. I particularly liked that the speakers actively engaged with each other and the audience during the overall discussion. Thanks to Lisa Rebecca Simon the session was excellently organised in terms of introducing the speakers and keeping the time. In conclusion, both presentations suggest that the role of culture in perception of self and others is an important emerging topic for future research.

Oral Session 2-A

Discussant and Author: Michael Levelink

This session included two presentations on technical innovations designed to help people with disabilities in their daily lives. Both projects can help to promote the quality of life of the respective target group on an individual level and to tackle future challenges on a societal level.

In the first contribution, Alhusain Abdalla and Mohamed Gastli from Qatar University presented an IoT based monitoring system, that informs caregivers about suspicious electrocardiograms and falls of persons who they look after. This telemonitoring system could allow people with age-related physical or cognitive disabilities to live widely self-determined for as long as possible and to feel more secure in doing so. This is especially true for sparsely populated areas where the nearest relatives or medical facilities are a long way off. Caregivers might also benefit from the system, since the expenditure of time and psychological burdens can be reduced. Beyond the elderly, people with other disabilities such as epilepsy could also benefit from this system if it would be adapted to their situation.

The monitoring system particularly addresses the challenges due to the demographic development. In many countries, such as Germany, the question arises, how increasing demands in social and health care of the ageing society can be met, while health care professionals are lacking. Against this background, telemonitoring could help to make health care more effective.

Penpitcha Wanglavan from King Mongkut University in Thailand introduced the toy like BLISS robot that can interact autonomously with children while in storytelling activities. It can be used by therapists or parents to support children with an autism spectrum disorder in developing the ability to understand mental states of other people (Theory of mind). With the robot, these skills can be trained more effectively than with conventional methods.

In addition to the project's focus on children, other groups can also benefit from the motivational use of learning robots. Various projects worldwide showed this for the elderly or dementia patients. In making learning sessions with psychotherapists and parents more efficient, the project also addresses the shortage of psychotherapists in many countries, such as Germany.

Oral Session 2-B

Discussant: J. Robert Hatherill

Author: Glenn Arthur Ricci

Starting off Oral Session 2: Health B presentations was the research of Koulod E. Mohamed et al. (Qatar University, Qatar) that examined the unknown association of vitamin D status with haematological and iron indices among the Qatari population. The researchers examined the data of 874 subjects, aged 18 to 40, from the Qatar Biobank. After adjusting for age and gender of the subjects, the data was put through a multinomial logistic regression model to examine associations between the data. The results showed that vitamin D was associated with low levels of ferritin, folate, vitamin B12, among others. Additionally, the findings showed a high prevalence of vitamin D insufficiency among the sample population, suggesting a need for vitamin D supplementation.

The next presentation looked at the research carried out by Seak-Lin Ly, Juan Botía, Samuel Kelsey, and Mina Ryten (University of Newcastle, Australia), which examined the relationship between the human brain and the expression patterns of iron-related genes as well as the expression patterns of other sets of gene functions relevant to electrical signaling. The research is valuable to understanding a healthy brain since too little iron is linked to poor brain function, while too much iron is typical of brain diseases. The research examined gene expression data from the UK Brain Expression Consortium project and the US Genotype-Tissue Expression project. The researchers found that a subset of iron related genes were frequently co-expressed with a set of genes related to myelin. The research demonstrated that the use of 'big data' from these projects can be used to examine new relationships between iron-related genes and other genes that may contribute to brain diseases and functions.

The third presentation was of the work by Crew Weunski, Aydan Hanlon, Sara Al-Nimer, and Amelia Chapman (Cleveland Clinic, Ohio, USA) that examined the use of true 3D-holographic guidance PTA (3D-HPTA) for the evaluation of liver tumours. 3D-HTPA was developed using augmented reality. Using a combination of GPS-tracked probes and the augmented reality HoloLens, the limitations of a traditional 2D screen were overcome. Their research showed the potential use of such technology when targeting liver tumours and suggest that such technology could be used to revolutionise surgery and cancer treatment.

Oral Session 3

Discussant and Author: Lynette Engeswick

This Oral Session included three excellent presentations from the health.

The first presentation was "Intergenerational health transmission in Uganda: Its moderators and persistence" presented by Julia Ran from the University of Chicago, USA. This study investigated if children born to malnourished mothers were more likely to suffer from growth impairments. Longitudinal data was using logistic regressions and analysis were performed on mother-child pairs from Uganda Demographic and Health Surveys from 2001 to 2010 measuring childhood stunting.

The second presentation was "The influence of sleep practices, chronotype, and life-style variables on sleep quality among students" presented by Joel Mvula from the Rusangu University, Zambia. This study was a quantitative approach to gain insights on student sleep and lifestyle practices were related to homeostatic restoration, thermoregulation, tissue repair, immune control and memory impacting student learning.

The third presentation was "A development of intelligent medical platform" presented by Sippakorn Saeng-arron, Thanapong Chuangyanyong, and Worachit Ketrungsri from the University of Technology Thonburi, Bangkok, Thailand. This study investigated the use of a cloud-based open-source medical platform designed to predict the probability of Melanomas diseases from images with a goal of transferring this technology for use in a telemedicine model for medical diagnosis in rural access to care populations. The data was from retrospective study of more than 30,000 picture and metadata which was analyzed for statistic specificity and sensitivity.

During the discussion, a common theme was identified as student/clinician/client behavior change models to inform "student/patient-centered feedback in health care and educational settings". The first presenter's research focused on objective evidence supporting the importance of improving long-term maternal/child health globally, the second presenter provided evidence that sleep and life style behaviors of college student impacts overall Grade Point Averages, and the third presenters provided evidence that telemedicine would increase access to health care in rural populations health care.

The concluding discussions included thought provoking ideas related to new areas of research and education for primary and secondary education for maternal/child health education with a focus on vulnerable populations and health care disparities, college student entrance education as it relates to college behaviors to insure student success and finally, the need to integrate telemedicine models to increase access to care for rural populations and those that may be in health care shortage areas.

Oral Session 4-A

Discussant and Author: Fatme Al Anouti

This was an amazingly rich session and the presenters illustrated the data in a very clear and professional manner. The first presentation entitled as"The HAILO Splint: A Remote Compliance and Force Sensing Splint for Base of Thumb Osteoarthritis" revolved around biomedical engineering and was presented by Balqees Haidar from The American University in Cairo, Egypt. She elaborated on the role of splints in the management of the auto-immune disease osteoarthritis. Her research proposed a wearable prototype which utilizes a 3D-printed version with integrated soft pressure sensors based on patients' hand. The sensors delivered data to a mobile application to monitor and store information on patient-compliance to treatment. Such an invention is significant to decipher the interaction between the splint and patient's hand and to provide personalized healthcare to patients who struggle with thumb osteoarthritis.

The second talk "A New Commensal Microbe Confers Protection Against Autoimmunity" was by Ayushi Thakur from the University of Toronto, Canada. She presented her research about the role of gut microbiome in modulating some autoimmune diseases like MS and arthritis. The presenter showed her data that confirmed the protective effect in food poisoning by competing with pathogens. An increase in IgA antibody secreting cells was observed *in vivo* using mice and hence the colonization with the protist protected mice from the development of arthritis and multiple sclerosis. This project which focuses on deciphering the relation between the host gut microbiota and disease development could be very promising towards understanding autoimmune disease pathology and diagnosis.

The last presentation "How Do Immune Cells and Gut Microbes Talk to Each Other?" was by Sung Min Lim from the University of Toronto, Canada. The talk was about the dynamic relation between immune cells and gut microbes. Microflora is essential in terms of nutrient uptake and immunological development. The host immune system ensures protection against gut microbes but when this role is exaggerated, some auto-immune diseases like multiple sclerosis and asthma might arise. The laboratory led by Professor Arthur Mortha had recently demonstrated that the innate intestinal immune system is orchestrated by microbiome and that a disruption of such a balanced interaction would pave the way for immunosuppressive regulation. Sung showed her data regarding the identification of signal mediated by gut microbiome that is crucial to activate intestinal macrophages via the involvement of Adenosine-Tri-Phosphate (ATP). She utilized using a combination of genetically modified microbes, luminescence assays, and *in vivo* systems. Such research is important to enhance our understanding of how the microbiome and our immune system interact to maintain a balanced state.

Oral Session 4-B

Discussant: Haleama Al Sabbah

Author: Glenn Arthur Ricci

Oral Session 4: Health B began with looking at the HIV and AIDS pandemic that effects communities worldwide. The research by Liliso Mangcunyana (Nelson Mandela University, South Africa) examines a South African community's knowledge of HIV risk, specifically schoolgirl's perceptions of HIV risk in Korsten, Port Elizabeth. This demographic was chosen because women 10 to 24 years of age are twice as likely to be infected with HIV as men of the same age. The project employed qualitative research, using visual research methods, drawings and participatory video with ten girls and looked to understand their perceptions of HIV. Some of the preliminary findings suggest that their perception is highly influenced by and linked to perceptions of social media, poverty and rape. These findings can help assist teachers and others to educate this demographic more effectively about HIV.

The next presentation looked at another group's perspective on a health affliction. This next presentation of the work by Zainab Abdulla (Zayed University, United Arab Emirates) looked at the stigma surrounding mental health and how female students perceive this issue. Like the HIV pandemic, mental health stigma can also be found around the world and this is due to the lack of information (or the abundance of misinformation) surrounding the issue. This study examined how female students at university perceived mental health. A positive result from this study showed that a majority of students were aware of mental health than were initially hypothesised. However, only a minority admitted that they would seek professional help, while others believed family background to be the source of mental health stigma. These findings can help reshape education materials on the subject to better address the misunderstandings and stigma surrounding mental health.

The third presentation tackled another worldwide issue from the perspectives of Guyana residents. Shikema Dey, Nerissa Persaud, Diana Mohamed and Pamela Rose (University of Guyana Berbice Campus, Guyana) created a documentary to address a British Broadcasting Company clip on suicide in Guyana, which they felt generalised attitudes towards suicide. Through semi-structured interviews, the team presents the insider's perspective on the issue and mental health in general. It showed that even though Guyana has the highest rate of suicide in the world, the people are generally concerned by the situation and of suicide in general. The documentary has the potential to raise the awareness of the issue to a larger audience as well as potentially help other countries that face a similarly high suicide rate.

Oral Session 5-A

Discussant and Author: Dorothea Kaufmann

Three young researchers presented their work at the Health A session.

Luke Bradshaw from The University of Auckland, New Zealand gave insight into his work where he established three-dimensional muscle models to elucidate the changes in muscle architecture from the infant to the adult. Furthermore, these models can be used to diagnose disorders like cerebral palsy at a very young age.

Brachial plexus birth injury (BPBI) is the most common nerve injury in children. In order to develop targeted treatments and therapies for different clinical injuries, Margaret K. Tamburro from the North Carolina State University, North Carolina, USA conducted a study in a rat model showing that the changes in underlying muscle composition are independent of injury location.

A very interesting mammal was introduced by Aaron Sandocal from the University of Florida, Florida, USA: The African spiny mouse (Acomys) is capable of scar-free tissue regeneration. He found out that the muscles of Acomys regenerated perfectly after multiple injections of snake venom and that large numbers of fat cells appeared in the muscle. Humans suffering from Duchenne muscular dystrophy similarly have their muscle cells replaced by fat cells, therefore the data from Acomys may help in understanding the progression of this disease.

All three talks highlighted the importance of basic research for the understanding of human diseases and the potential development of treatments and therapies. The researchers showed great commitment to their projects and were very happy to discuss their studies with the audience. Who knows – maybe the regeneration potential of Acomys can be used for the treatment of brachial plexus birth injury and the outcome of this study will be imaged in three-dimensional muscle models?

Oral Session 5-B

Discussant: J. Robert Hatherill

Author: Glenn Arthur Ricci

The presentations of Oral Session 5: Health B largely surrounded the contaminating of food with heavy metals and pesticides; a problem that can be found around the world no matter the level of development a country has. The first presentation of research by Ayoo Polycarp and Oloya Benson (Muni University, Uganda) proposed to examine the concentration of heavy metals in tilapia fish, sediments and water in Uganda. The negative effects of heavy metal need not be gone over here, suffice to say that they are not something that leads to a healthy life and certainly should not be found in food and water that is being consumed. By examining the river Enyau of the Arua district in Uganda, which is used for both small- and large-scale fishing, as well as for local domestic purposes, the level of heavy metals can be determined in both fish, land and water. This is especially important for the region since the Enyau river source is part of a densely populated region with numerous coffee, tobacco and maize plantations and well as various industrial buildings, all of which could have a significant impact on the wildlife and land. Such contaminants are sure to run off into the water and effect the population, especially further down river.

The following presentation also looked at heavy metals, this time along with levels of hormones and antibiotics, in imported meat. Afnan Alblooshi's (Zayed University, United Arab Emirates) project was to investigate the presence of heavy metals and certain antibiotics in a representative sample of frozen poultry products that were imported from various countries into the United Arab Emirates. From the markets of Abu Dhabi, a variety of chicken products were selected from various countries to be tested. The hypothesis from the beginning of the project is that the levels of heavy metals in the chicken will be lower than the maximum allowed levels set by international health organisations. The results of the testing were presented at the session and the finalised data is planned to be disseminated in the near future.

The third presentation of the work by Dikshit Poudel and Narahari Prasad (Agriculture and Forestry University, Nepal) also examined contaminants found in food markets. Their work looked at the rapid bioassay of pesticide residues in vegetables at the Kalimati Market, Kathmandu, Nepal. Using samples of cauliflower, tomato, bean and potato (among other vegetables) gathered from 2014 to 2018 by the Rapid Bioassy Pesticide Unit it was found that these named produces have the highest levels of pesticide residue that the other produce gathered. Interestingly, it was found that the cauliflower, tomato, bean and potato more commonly came from Kavre, Sarlahi district of Nepal and India. On a positive note, however, it was found that the levels of pesticide showed a decreasing trend from 2014 to 2018, suggesting an increase in farmer awareness of the situation and the dangers of high levels of pesticides.

Oral Session 6-A

Discussant and Author: Jing Tan

This Oral Session included two excellent presentations from the health fields of Psychology and Medicine.

The first presentation is "Medication assisted treatment (MAT) for opioid use disorder (OUD) in pregnancy: Program and psychiatric implications in delivery and neonatal outcomes of success" by Avery Mayer from The Ohio State University, USA. The second presentation is "Home Dialysis Patients' Perspectives on the Utilization of Patient-Reported Outcomes: Keep Me Involved!" by Rita Iradukunda from University of Alberta, Canada.

Both presentations investigated the outcomes of interventions, Substance Abuse Treatment, Education and Prevention Program (STEPP) and Home Dialysis respectively, but adopted very different approaches. The first presentation used a quantitative design to evaluate the treatment outcome of STEPP. The data was from retrospective medical chart review and was analyzed through statistic tests. The second presentation adopted a qualitative approach to gain insights from the patients' perspectives on the home dialysis treatment. Interviews and focus groups were conducted to gather data and thematic analysis was utilized to answer the research question.

During the discussion, a common theme of "patient-centered feedback in health care settings" was emerged. In the medical setting, the tradition is to focus on more objective indicators for treatment outcome and effectiveness. The new trend is to incorporate more patients' feedback and to be patient-centered. The importance and barriers for this new trend was discussed.

Oral Session 6-B

Discussant and Author: Dorothea Kaufmann

Diabetes was the link between the three presentations of this session.

Colleen Newey from the Brigham University, Utah, USA spoke about the role of PAS (Per-Arnt-Sim) kinase as a therapeutic target for the treatment of high triglycerides and metabolic diseases like diabetes. She studied the PAS kinase related phenotypes in mice placed on a high fat high sugar diet and quantified the metabolic rate of various cells from the PAS kinase and wild type mice and found out that the PAS kinase controls glucose at a key point of glucose partitioning.

A simple screening tool for Type 2 diabetes mellitus (T2DM) in Qatar was presented by Khaled Wagdi Sadek from the Qatar University, Qatar. A sample of 200 individuals was cross-sectionally evaluated to determine the best predictive variables for type 2 diabetes mellitus. Age, gender, BMI, hypercholesterolemia status and hypertension were found to be statistically significant in predicting T2DM; individuals with high scores in these variables should therefore undergo further testing and early lifestyle modifications for primary prevention.

Incretins were the hormones of interest for Ivan Beltran from the Universidad Antonio Nariño, Colombia. His research aimed to elucidate the molecular mechanism that regulates the production of the incretin glucose-dependent insulinotropic peptide (GIP). GIP plays a major role in insulin secretion and proliferation of pancreatic beta cells. Therefore, GIP might be a target for novel therapeutic strategies in metabolic diseases and obesity treatment.

All three talks were very well received by the audience and sparked a lively debate about metabolic diseases, early detection and prevention as well as novel therapeutic strategies.

Kaufmann: Health Oral Session 6-B

Oral Session 7-A

Discussant: Alex Müntz

Author: Glenn Arthur Ricci

Oral Session 7: Health A began by examining the possibility of using a traditional Aboriginal bush medicine for modern health issues. The research of Eden Little (Griffith University, Australia) looked at the Gumby Gumby plant that has traditionally been used for skin disorders or viral infections, which anecdotally have been successful in providing cures. Still, this plant remains neglected in the scientific community. This study explored the Gumby Gumby as a potential medicine that may even lead to finding chemicals for drugs that target specific diseases. To do so, the project used chemistry techniques, spectroscopic technology and the chemical composition was done using high-performance liquid chromatography and other methods. The purification of the extract still needs to be tested and the pure compounds evaluated, but the research direction shows promise for assisting human health.

 The second presentation kept the theme of 'new medicine' going by also looking at the potential of developing new cures for health problems. This project by Aram Mohammed, Rawezh Hamasalih, Barham Abdurrahman, Salar Abdulaziz and Soma Barawi (University of Sulaimani, Iraq) examined the antimicrobial mode of action of grapefruit seed extract on virulence plamid fluids found in local isolates of Klebsiella pneumoniae. This is an interesting approach since the grapefruit seed extract is already a commercially available, natural product. This project specifically looked to investigate the effect of shear-induced degradation of virulence plasmids by the extract. The study found that the extract mode of action against K. pneumoniae and seems to be a promising demonstration of the dual effects of the seed extract for antigrowth and antibiofilm activities to fight against K. pneumoniae.

Of course, medicines are only as good as the doctors that prescribe them. To provide the right amounts of medicine, a proper dose needs to be given. The third presentation of research by Jason Jaikissoon and Petal Surujpaul (University of Guyana, Guyana) attempted to determine measured and estimated organ doses of the thoracic cavity in order to quantify the doses received. The project was carried out in a simulated environment with pig organs (which have a similar layout to a human's) with a RaySafe detector with a Siemens Fluoroscopy. What the project found was that their results, when compared to established diagnostic reference levels for a standard chest x-ray, were that the doses were approximately 47% below the measured estimated effective doses. Continued research in this direction could prove useful as technology advances beyond the use of x-rays for medical diagnosis.

Oral Session 7-B

Discussant and Author: Mathabo Khau

The seventh oral session on Health included 3 interesting presentations which explored the concept of health from different perspectives of the circle of life.

In the first presentation, Rachel Cicoria, from the Florida Gulf Coast University, USA, presented on "*The Dignity of a Relational Death: Redefining What It Means to Die a Good Death*". She was responding to the question "what does it mean to die a good death?" she explored the concept of a dignified death in relation to the dying agent as an autonomous being with capacity for self-direction and choice. She argues that the death promoted by the legislation regarding Death with Dignity (DWD) cannot be a good death because it depends upon a conception of human nature that cannot account for the interdependence and relational autonomy that characterize human existence. She, therefore, proposes what she calls *relational death* as an example of a dignified death, based upon Judith Butler's conception of relationality.

The second presentation was by Eileen Jahn from the University of Bremen, Germany. The talk was titled ""*Three Parents for a Healthy Child": An Investigation of the Reporting on the Genetic Modification of Human Gametes*". She discussed a procedure which uses preimplantation genetic diagnosis and in-vitro-fertilization, which is designed to prevent women diagnosed with mitochondrial DNA anomalies from passing on genetically derived diseases to their offspring and is legally legitimized in Britain. This process marks potentially ill children as risks worth avoiding! While the procedure is legalized, the decision for oocyte modification lies with the mother, making this a very difficult position for motherhood!

Lastly, Elizaveta Khenner from the University of Kentucky, USA, presented on "Archival and Historical Perspectives on the Mental Health of Displaced Children". She focused on the mental health care of displaced and refugee children living in Germany in the post-WWII period and today. Her talk examined the intersection between the mental health issues experienced by refugee children and their integration into the new communities. She evaluated whether significant improvements have been made in caring for traumatized displaced children in the last 70 years and provided insight into ways to better help the millions of children currently facing displacement and trauma.

The three talks addressed the circle of life from birth, transition and finally death. They brought forth discussions of the fact that "*relations determine our being from beginning to end*". The idea of *Playing God* came up in discussions in terms of the interference with unborn babies and deciding which baby is fit to be born; or which child should *belong* where in the case of refugee children; and finally who decides when it is time to die in dignity. The discussions highlighted the idea of power and choice; and how these can be limited in certain situations at the disadvantage of the agent; in this case children, women and sick people.