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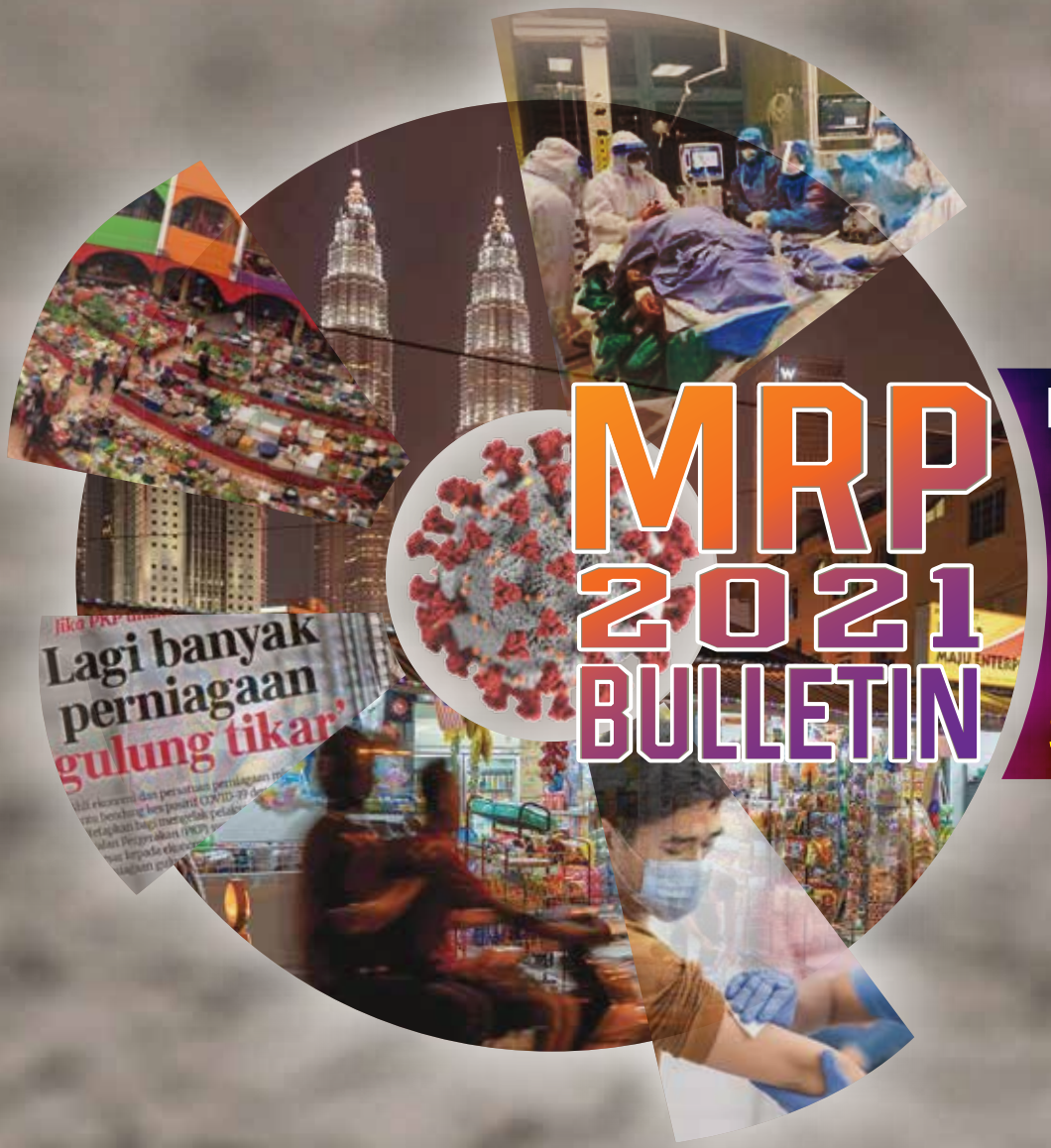

MRP 2021 BULLETIN

MONTHLY RESEARCH PRESENTATION SCHOOL OF MEDICAL SCIENCES

Grow Resilience through Difficulties

Contents

Every difficulty in life presents us with an opportunity...

- MRP Team 2021 -

from the Dean

Assalamualaikum & Salam Sejahtera.

May Allah s.w.t showers His countless blessing on all of us.

I would like to take this opportunity to thank Professor Dr. Rosline Hassan as a Deputy Dean (Research & Innovation) and her team for their effort to produce this 2nd edition of the MRP bulletin for the year 2021.

The current pandemic never retard the research sharing activities in PPSP; instead, it is growing tremendously. I found the concept of 'Grow Resilience Through Difficulties' reflects the spirit of academicians in PPSP. I believe these challenges will give a better outcome if everyone considers it a chance. So keep things in perspective and keep moving.

We are grateful for the technology that brings research more inspiring. With various exciting research and innovation had been presented, I would say that this is successful indeed, despite the challenging situation that we are facing. I found the quality of research, innovation and presentation is getting better and better for PPSP, Alhamdulillah.

Congratulations to the team, and we pray that PPSP will produce higher impact research on society.

Thank you.

Professor Dr. Abdul Razak Sulaiman
Dean
School of Medical Sciences
Universiti Sains Malaysia

In the middle of
difficulty lies
opportunity

- Albert Einstein -

from the Advisor

Assalamualaikum warahmatullah & Salam Sejahtera.

Dear Colleagues,

Alhamdulillah, the year 2021 is coming to an end, and again MRP team would be keen to end the year with an inspired gift in the form of the MRP bulletin. Congratulation committee members, chaired by Associate Professor Dr. Wan Faiziah Wan Abdul Rahman, have successfully conducted a new Norm of Monthly Research Presentation and work hard to produce this end-year piece of the 2nd MRP bulletin.

'Grow Resilience Through Difficulties' is an inspiring concept as the COVID-19 pandemic has greatly improved research delivery to the academician. The bigger the challenge, the bigger the opportunity for growth. Therefore, let everyone embrace and overcome it in positive ways. Then, let us find the opportunities that lie between that difficulties.

A huge thanks and appreciation to all the experienced speakers who have committed their time, and shared valuable materials in this 2nd edition MRP Bulletin. I am indebted to all who have contributed to the delivery of this publication and it is hoped that the bulletin will uplift the knowledge and research motivation.

Enjoy reading and May ALLAH blesses us and grant our work with barakah.

Thank you,

Professor Dr. Rosline Bt Hassan
Deputy Dean (Research & Innovation)
School of Medical Sciences
Universiti Sains Malaysia

The bigger the challenge,
the bigger the opportunity.

from the desk of the Chairperson

السَّلَامُ عَلَيْكُمْ وَ رَحْمَةُ اللهِ وَبَرَكَاتُهُ

Salam Sejahtera.

Alhamdulillah.

The 1st edition of MRP bulletin 2020 had a new impact on USM research with the butterfly concept: Transforming Ideas Into Reality. This 2nd edition portrayed a resilience concept: Grow Resilience Through difficulties. This concept was inspired by the outstanding achievement of PPSP lecturers in research. Nevertheless, they were facing challenges due to the Covid-19 pandemic. This 2nd piece is a compilation of research synopses that assembled a variety of successful research and innovation throughout the year, including the research on Covid-19 that is absolutely able to give direction for academicians.

My special thanks to MRP advisor, Professor Dr. Rosline Hassan (the Deputy Dean of Research & Innovation) for her guidance, and our Dean, Professor Dr. Abdul Razak Sulaiman and Deputy Deans for their courage and everlasting support. Furthermore, I would like to thank all the great speakers for their full commitment to delivering the talk and preparing the synopses. Last but not least, special gratitude to my fantastic MRP team for their hard work.

We know that life may not come with a map. By building resilience from adversities that we face probably can create a roadmap. What important is, focus and move toward the goals. Hopefully, this special piece with the resilience concept would encourage us to be resilient in whatever circumstances, inject some motivation in research, innovation and publication, Insha Allah.

Thank you.

Associate Professor Dr. Wan Faiziah Binti Wan Abdul Rahman
Chairperson
Monthly Research Presentation 2021
School of Medical Sciences
Universiti Sains Malaysia

Resilience is the art of wonderful living...

- wfwar 2021 -

To **introduce good researchers** in PPSP

To give **opportunity** for researcher to **share** their research & innovation

To **encourage** research **collaboration**

To **emphasize** on research with certain **grants award**

To **motivate** researcher to **publish** their research in **high impact journal**

MRP 2021 BULLETIN

17 RESEARCH SYNOPSES SCHOOL OF MEDICAL SCIENCES

Mass Hysteria Among Secondary School Students In Kelantan; A Phenomenological Approach

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Hysteria is not an uncommon phenomenon, with long-dated history and occurs across populations. It was first considered a physical illness in the medical field that presented with multiple physical and behavioural dysfunctions. Later in the 19th century, hysteria was redefined as a mental disorder, but the diagnosis was challenged and reconceptualised multiple times. With the mass hysteria phenomenon, the diagnosis remains contentious and challenges the management approach. While mass hysteria is high in Malaysia, this phenomenon is poorly understood and frequently influenced by cultural and spiritual reasons. This challenged the mental health professional to deliver an effective treatment approach. Therefore a qualitative interpretative phenomenological approach with face to face in-depth interviews was conducted among 20 Malay adolescents aged 13 - 17 years old (mean age of 14.3 years), who were affected by the mass hysteria outbreak in 2016.

The study aimed to understand the phenomenon and explore the participants' belief systems and help-seeking behaviours. All participants are Muslim Malays, with half of them being either youngest or eldest siblings, and the majority of the participants came from the low socioeconomic household. Data were transcribed and analysed using thematic analysis. Three main themes emerged as 'Culture Stereotyping', 'Idiom of Distress' and 'Social Reinforcement Factors', and these understanding led to religious and spiritual help, while the underlying psychological stress was silent. None seek professional help, and unresolved conflict remains untouched. Hence mental health professionals need to detect the issue, and there is a dire need for them to have cultural competency skills in managing the problem.

Clinical Predictors for Embryo Quality Among Advanced Age Women Undergoing ICSI Cycles

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Advanced maternal age (AMA), defined as women aged between 35–45 years, is associated with a decline in infertility. This is the result of depletion in ovarian reserve, declining oocyte and embryo quality, and poorer endometrial receptivity for embryo implantation in this group. In addition, the risk of translocation transformation is also higher, causing an increase in miscarriage. Despite the known age-related fertility issues, the number of AMA seeking Invitro Fertilisation (IVF) in our unit has increased throughout the years. This trend has created an excellent challenge for fertility specialists in managing them.

Embryo quality is one of the decisive factors of a successful IVF/ICSI cycle. Presently, embryo quality is determined by its morphological appearance. Previous studies have identified multiple morphological kinetic markers that can predict embryo competence. However, such identification requires technological competencies that may not be readily available in many centres. In such centres, the use of clinical predictors of high-quality embryos would be especially beneficial in predicting the course of IVF cycles. In addition, these predictors can help the physician and couple to decide the extent of treatment without unnecessarily increasing cost. Unfortunately, to date, clinical predictors of embryo quality in AMA are limited.

The present study aimed to determine the clinical factors that contribute to the development of good-quality embryos among AMA and to determine their outcome after ICSI treatment. We performed a prospective observational study, conducted on 941 oocytes, retrieved from 124 women of advanced age receiving ICSI over 36 months at the Hospital USM. All women were stimulated using the same follitrophin beta at 300iu daily in the GnRH antagonist regime. The Society of Assisted Reproductive Techniques system was used to determine the morphological grading of embryo quality. Fertilization rate, cleavage rate, and pregnancy rate were expressed as a percentage per cycle or transfer. Possible predictors of high-quality embryos were evaluated using single and multiple regression tests, with $p < 0.05$ considered significant.

Among 586 available embryos, 288 (49.15%) high-quality embryos were obtained. The fertilization and cleavage rates were 86.18% and 97.83%, respectively. After performing both single and multi-regression analysis, it was noted that the total number of stimulated follicles, number of retrieved and mature oocytes (R2 = 0.857) and total available embryos (R2 = 0.857) were closely related to high-quality embryos (Table 2). Seventy-six embryo transfers were conducted, with 17 successful conceptions (implantation rate = 22.37% per transfer). There were three miscarriages and one ectopic pregnancy. This study has shown that there is evidence that embryo quality declines with maternal age. The chance of obtaining a high-quality embryo can be improved by increasing the number of collected oocytes and available embryos. This measure can be achieved by regulating the stimulation regimens and methods of embryo incubation.

AEEMI: 'SDG 4' IN ANATOMY

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Quality assurance is an essential element in ensuring quality education. A holistic quality assurance process not only includes evaluation of external parties on an educational program but also requires a reflective self-assessment from the internal stakeholders on the program's educational environment. Understanding the educational environment is pivotal prior to any program evaluation and change as it provides valuable input on the elements that affect students' learning. Hence, it is crucial to use a validated instrument, which measures specific educational environments related to the program.

For anatomy education, a questionnaire known as the Anatomy Education Environment Measurement Inventory (AEEMI) was developed by a group of anatomy lecturers in Universiti Sains Malaysia. The domains and items of the AEEMI were developed through a six-round Delphi technique involving nine anatomists and five medical educationists. There were 11 domains and 132 items generated from this stage, and these domains and entities underwent two cycles of validation process; (i) the content validity that involved 10 anatomists from Malaysia, the United States, the United Kingdom, India and Australia; and (ii) response process validity that involved 30 medical students from a public medical school.

A total of 26 items with less than 0.8 validity indices were removed, and the remaining 106 items underwent internal structure assessment through construct validity evaluation that involved 325 medical students in a public institution. This evaluation produced the first version of AEEMI with six domains overlying 25 items that measure students' perceptions of anatomy teachers, anatomy content, the importance of anatomy knowledge, anatomy learning resources, self-efforts in learning anatomy, and quality of histology learning facilities. To increase the generalizability of AEEMI, this instrument was cross-validated in 11 public and private institutions in Malaysia. The final cross-validated version of AEEMI contains five domains and 26 items, measuring students' perception of anatomy knowledge relevance, anatomy teachers, anatomy subject mastery and anatomy learning resources. The cross-validated AEEMI version captured variations that may exist in the anatomy education environment among the involved institutions in Malaysia, hence it serves as a functional benchmarking tool for quality assurance.

Although the AEEMI was developed and validated in the Malaysian context, the AEEMI may be applicable to other countries as it is assumed that the anatomy education environment is similar. Nonetheless, further studies should be carried out to validate the AEEMI on a global scale, which will increase its generalizability.

Future Medical Diagnostics: From Bench To Lab-On-Chip Via Biosensor Technology

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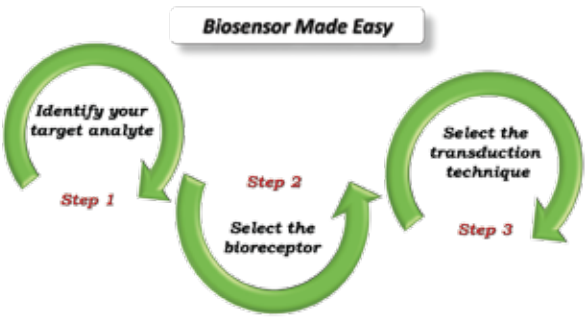
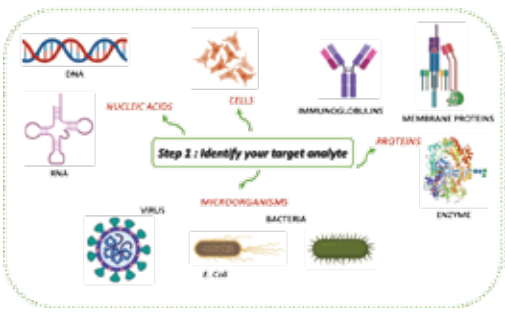
Fundamental research in genomic, proteomic, transcriptomic and many more are vital for the innovation in applied diagnostics. Current trends show the promising translation of these researches into a lab-on-chip device that offers enormous potential for commercialisation. This lab-on-chip innovation can be achieved via synthetic bioreceptors and biosensors technologies. Biosensors are analytical devices incorporating a biological material as the biorecognition molecule, which is integrated within a physicochemical transducer or transducing microsystems. The binding of the target analyte onto the biosensor surface will be converted into measurable output.

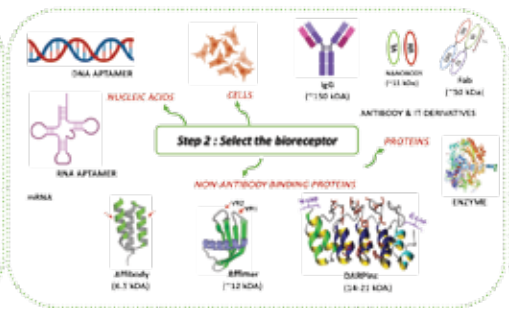
In brief, there are three key steps that are essential when developing a biosensor. The first step is to identify the target analyte. This target can be in a diverse range of molecules, including nucleic acids (e.g. RNA or DNA), proteins (e.g. membrane protein, enzyme, immunoglobulins, etc.), cells, toxins and microorganisms (e.g. virus or bacteria). Followed by the selection of appropriate bioreceptors that targeted the analyte. The bioreceptors can be nucleic acids, proteins, cells and antibody-based. The final step is to select the transduction technique as a measurement method for the chip system. The transduction technique can be classified as optical, mechanical and electrochemical based. The typical example of optical-based biosensors is ELISA, fluorescence imaging, PCR and DNA microarray. Whilst mechanical-based biosensors are mainly used in the detection of cancer cells. The most popular and commercially available on the market is electrochemical-based biosensors. For instance, the glucose biosensor and wearable potentiometric biosensor.

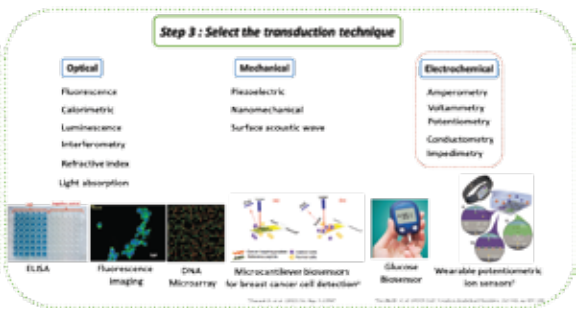
The CEA-Affimer project is one of the examples in translation from fundamental research into applied diagnostics. This study demonstrated multiple applications of Affimers detecting the CEA. Affimer is an alternative affinity binding protein that shows promising and comparable applicability to antibodies as a monoclonal reagent in diverse biomedical applications. Whilst, CEA is a validated blood-based protein biomarker for colorectal cancer detection. Anti-CEA Affimers show excellent sensitivity and specific detection in bioanalytical, fluorescence-bioimaging, theranostic, targeted drug delivery, and biosensors (optical and electrochemical-based). Alternatively, the nucleic-acid based affinity bioreceptor known as Aptamer also shows promising potential. There are two types of Aptamer technology based on Systematic Evolution of Ligands by Exponential Enrichment (SELEX) and in silico technique. SELEX is a wet laboratory technique, whilst in silico is a dry laboratory technique using bioinformatics tools. The advantage of generating Aptamer using the in silico method is it enables molecular docking for simulation. This will allow the selection of a specific region for binding onto the target, optimising the strength of affinity binding, and easy modification for chemical conjugation (e.g. fluorescence probe, HRP-labelling, etc.).

In summary, the Aptamer and Affimer are alternative synthetic bioreceptors robust, highly thermostable, consistent batch production and more economical than the antibody-based system. Therefore, these non-antibody based bioreceptors have big potential as a detection reagent, particularly in the development of future lab-on-chip biosensor diagnostic tools for cancer and diseases detection.









Point-of-Care Procalcitonin Test in Ventilated-Associated Pneumonia: A Randomised Clinical Trial

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Antibiotic stewardship guidelines are essential for all physicians to adhere to in order to reduce unnecessary exposure to broad-spectrum antibiotics and hence prevent emerging multidrug resistance organisms in the Intensive Care Unit (ICU). In the ICU, the diagnosis of sepsis and ventilated associated pneumonia (VAP) was commonly found in prolonged ventilation patients. Most of them require broad-spectrum antibiotics during initial treatment because of unknown organisms. The duration of antibiotic therapy usually depends on the patient's culture and sensitivity, severity, diagnosis, and clinical improvement. The standard care parameters used were the level of total white cell count, C-reactive protein, temperature value, and imaging such as chest radiograph. Even though the guidelines suggested five to seven days is the most appropriate duration of antibiotics, the clinician sometimes requires extra parameters to assist them in deescalating the antibiotics as early as five days.

The common biomarker used to help clinicians is the point of care procalcitonin (PCT). PCT is the 116-peptide molecule of protein synthesis from the liver and other tissues in response to bacterial infection. In healthy subjects, it is found in low levels (≤ 0.1 ng/mL). The optimal and widely used cut of the value of procalcitonin is 0.5ng/ml with a sensitivity of 76% and specificity of 69%. In ICU patients, the sensitivity and specificity were 89% and 68%, with a positive predictive value of 28% and a negative predictive value of 98%. Therefore, inappropriate continuing antibiotics in normal procalcitonin were not advocated to avoid unnecessary prolonged antibiotics exposure.

The study aims to assess the efficacy of point-of-care PCT serial measurement in determining antibiotic duration and exposure in patients within 28 days. A total of 83 patients were randomised into standard care and procalcitonin-guided groups. Stopping antibiotics is encouraged if the procalcitonin level is ≤ 0.5 ng/mL or reduced by >80% from the initial level. The study reveals PCT group had a significantly lower mean (SD) antibiotic treatment duration (10.28 [2.68] days) than the control group (11.52 [3.06]). The mean (SD) difference was −1.25 (95% confidence interval [CI], −2.48 to 0.01; t-statistic [df] = −1.997 [83]; P = 0.049). The PCT group also had a higher number of antibiotic-free days alive during the 28 days after VAP onset than the control group (mean [SD], 10.79 [7.61] vs 8.72 [6.41]). The study shows that the recurrent infection rate was 32.6% (14 cases) in the PCT group and 40.5% (17 cases) in the control group (P = 0.448). In conclusion, the point of care PCT safely provides added value to shorten the antibiotic treatment duration in patients with VAP.

In-Vitro Bio-Sensing Diagnostics

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Diagnostic is an important assay for detecting and identifying communicable and non-communicable diseases to give the clinician the test results for the patient's accurate management and treatment. The medical biosensing diagnostic technologies can be divided into in-vivo and in-vitro. The in-vivo diagnosis occurs on humans, such as ultra-sound, biomotor/ nanomotor, body sensor networks (smart implant), etc. However, in-vitro diagnosis occurs in the test tube, such likes detection of nucleic acids (pathogen's DNA, Genetic disorder based on the mutation), protein (antigen, antibody & biomarkers), and biochemistry (glucose, hydrogen, C13 urea breath, CO, etc.).

This synopsis focuses on in-vitro diagnostic technologies developed under cholera molecular diagnostic team to develop novel diagnostic tests for V. cholerae, vancomycin-resistant enterococci (VRE), methicillin -resistant Staphylococcus aureus (MRSA), fungus, etc. The team uses PCR, lateral flow dipstick, and biosensor for rapid, sensitive, and specific detection of infectious diseases. In addition, the research focuses on the development of alternative detection methods for nucleic acids and protein using electrochemical biosensors and lateral flow immunochromatography assay.

The team has developed Cholera Genosensor, a thermostabilized cholera PCR kit that uses a portable amperometric biosensor to detect PCR amplicons. Besides that, the team also developed a gold nanoparticle-based lateral flow immunochromatography assay to detect V. cholerae (O1 and O139 serogroups). In addition to the Cholera Genosensor, the EZGenostick has been developed for the universal detection of the nucleic acid amplicon, which is both easy to perform and environmentally friendly. The biosensor team is also developing an ultrasensitive genosensor and immunosensor to detect V. cholerae.

In conclusion, the diagnostic assay technology platform developed will have good implications for the disease's monitoring, prevention, diagnosis, and therapy. And based on our experiences, the technologies need to match with the market demand based on the nature of the disease, nature of the sample, environment requirement, location of where the test will be performed is used to determine the suitable method, cost and reliability of the assay.

Research products developed by the cholera research team

Electrodes and hand-held readers used in biosensor research

MyRA B4e

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Malaysia Research Assessment (MyRA) is an instrument used by the Higher Education Institution in Malaysia to assess their research capability and performance. Although much emphasis was given to the research and teaching, there is a small portion of marks allocated to the achievement of the capability of the researchers to present their innovations and research findings in the Research Exhibition. This portion of MyRA was categorized under MyRA I, Section B (Quantity and Quality of Researchers), under subset 4e (Research Exhibition Awards).

The Research Innovation Exhibition included in this category have the national competition (Persidangan dan Ekspo Ciptaan Institusi Pengajian Tinggi Antarabangsa (PECIPTA), Malaysia Technology Expo (MTE), International Invention, Innovation and Technology Exhibition (ITEX) and Biomalaysia & Asia Pacific Bioeconomy) and the international research exhibition (Korea Seoul International Invention Fair (SIIF), British Invention Expo (BIS), Pittsburgh Remodeling Expo, Invention and New Product Exposition (INPEX) and Germany International Trade Fair Ideas (IENA). Only gold medals and special awards in these prestigious tournaments will be counted for MyRA. In this talk, the presenter shared his previous experience winning gold medals at both national and international levels. The presenter also shared the difference between the Research Exhibition and the Innovation and Creative (KIK) and some tips and tricks to excel.

Last but not least, the presenter shares the previous marking scheme for the innovation competition and encourages other school members to take part in this potentially addictive, rewarding extracurricular endeavour.

When Two Worlds Collide: The Intriguing Journey of an Eccentric ORL-Head and Neck Surgeon

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Doctors working as academicians in tertiary university hospitals are expected to be functioning as teachers, researchers and clinicians. Not only that, they are presumed to be supremely exceptional in performing each of the job descriptions ascribed to them. However, there might be a conflict between all the roles they need to fulfil. Academicians are appraised by the publication of their research work in peer-reviewed journals and how many research grants they are able to acquire. This requires a strong commitment and dedication on the part of the clinicians to achieve such a feat. Will it not then force teaching and clinical work into 2nd place?

Another aspect is clinicians who are good in teaching and clinical work, who are supposed to do research work simultaneously, might feel forced to do it and not out of their willingness and interest. Though the arguments and concerns are not without merits, doctors who have willingly taken up the challenge as academicians to train and educate the future generation of doctors and at the same time produce good quality research and publication must be disciplined and passionate to accomplish those tasks expected of them.

Working as an otorhinolaryngologist-head and neck surgeon in Universiti Sains Malaysia, my initial interest is to treat and manage sick patients as well as teach my students how to manage and treat their patients. But I realize that I will not be able to perfect the above tasks without research and publication. So begins my journey of using all resources at my disposal to ensure all three components are achieved. I would like to illustrate by using the example of the challenge of diagnosing patients with upper aerodigestive tract tumours by treating doctors.

Upper aerodigestive tract tumours have a better prognosis and outcome when they can be diagnosed early and essential treatment initiated. However, sometimes we come across problematic cases where a diagnosis is dubious. We need to find a method to address such circumstances. An optical diagnostic is one of the options to do that. Working with experts from Germany and Singapore, we validated a system to score the vascular patterns seen on tumours to classify them as benign or malignant. Such a system will help doctors globally to recognize and diagnose such tumours early and offer an improved diagnostic method for patient's care. The icing on the cake is accepting the research work in one of the high standing Q1 journals. (Figure 1)

Figure 1. Publication in Scientific Reports, a nature journal


www.nature.com/scientificreports

SCIENTIFIC REPORTS
nature research

OPEN

Ni endoscopic classification for Storz Professional Image Enhancement System (SPIES) endoscopy in the detection of upper aerodigestive tract (UADT) tumours

Baharudin Abdullah[1✉], Nurul Syeha Abdull Rasid[1], Norhafiza Mat Lazim[1], Veronika Volgger[2], Christian Stephan Betz[3], Zahiruddin Wan Mohammad[4] & Nik Fariza Husna Nik Hassan[1]

The diagnostic procedure for upper aerodigestive tract (UADT) tumours is by white light endoscopy (WLE) combined with biopsy. However, WLE has difficulty identifying minute epithelial changes which hinders early diagnosis. Storz Professional Image Enhancement System (SPIES) is designed to enhance the visualization of microvasculature on the mucosal surface and detect any epithelial changes. In this study, we aimed to evaluate the use of Ni endoscopic classification with SPIES endoscopy in the detection of UADT tumours. Fifty-nine patients with suspected UADT tumours underwent WLE followed by SPIES endoscopy. All the tumours were biopsied and sent for histopathological examination (HPE). The kappa index (κ) was used to evaluate the agreement between the methods. The level of agreement between SPIES using Ni classification and HPE showed almost perfect agreement as compared to moderate agreement between WLE and HPE. The sensitivity and specificity for WLE and HPE were 77.5% and 84.2% respectively with positive predictive value (PPV) of 91.2% and negative predictive value (NPV) of 64%. The sensitivity and specificity for SPIES endoscopy using Ni classification and HPE were 97.5% and 94.7% respectively with PPV of 97.5% and NPV of 94.7%. SPIES endoscopy using Ni classification is a valid tool for earlier tumour detection.

Ace in Research: A Guide For Busy Clinicians

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Evidence-based medicine guides clinical decisions. Evidence is derived from well-conducted research outcomes. A clinician is the best person to conduct clinical research. The main hurdle for clinicians is they are busy. Conducting research in a busy clinical practice is daunting and disheartening for most clinicians. No doubt, many clinicians shy away from research. However, with a good strategy and smart planning, it is not impossible.

An inquisitive mind is a key to creating new research questions and ideas. A research question is easily derived from our daily clinical practice. Nurturing the young mind is another important strategy, combining mentoring and research. *Curiosity killed the cat, but at least he died knowing.* Acquisition of research grant is another important element to accelerate further research, training of postgraduate students and potential collaboration. With the right strategy, research, teaching, and clinical work can be conducted in one place.

Don't walk alone, walk together as a team. The multidisciplinary team is the best, especially a combination of clinical and lab-based researchers. Strengthen the team with national and international collaboration. Ensure that your team members benefit from this collaboration. Collaborative research will increase your visibility. Visibility is essential to boost your presence in the scientific community and public. At the end of the day, your effort is effective if it brings changes to your clinical practice. Be an excellent practitioner, treat your patient with scientific evidence. Clinicians are researchers! A good one indeed.

Six important tips to ace in research

Be a tall tree that is visible and provide shade to the ones below

Sentinel Lymph Node Mapping and Biopsy in Breast Cancer: From Research to New Service

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Sentinel lymph node biopsy (SLNB) has become the standard of care for early-stage breast cancer patients with negative axillary lymph nodes (ALNs). A successful SLNB is determined by the mapping (SLNM) approach as it affects the identification rate (IR) and false-negative rate (FNR). However, current SLNM standards require specialized medical instruments and other resources.

According to the Breast Health Global Initiative, the intraoperative blue dye tracer is the most conventional and cost-effective SLNM technique, making it highly recommended to be used in low-resource settings. Radioisotope tracer mapping via preoperative lymphoscintigraphy and intraoperative gamma-probe was also recommended, but only for institutions with enhanced resource levels. By combining the blue dye with a radioisotope, researchers have found that it would improve the IR and FNR instead of using a single tracer. Although no standard methodology exists, the dual tracer technique is considered the gold standard in many medical guidelines. Recently, a single-photon emission computed-tomography /computed-tomography (SPECT/CT) scanner was also considered for inclusion in the preoperative SLNM workflow. This hybrid imaging tool provides functional and anatomical information from the SPECT and low-dose CT components. In addition, it produces a detailed three-dimensional view of the SLN's location through SPECT/CT image co-registration, which would then help observe the surrounding structures essential for optimal image-guided surgery.

It is known that the radioisotope mapping technique is not widely practiced in this country and, even more so, the use of SPECT/CT scanners. This is evident because there are a limited number of nuclear medicine services mainly concentrated in major Malaysian cities. As of now (2021), there is only one nuclear medicine facility (Hospital USM, Kota Bharu, Kelantan) that serves the entire east-coast region of Peninsular Malaysia – which covers three states (Pahang, Terengganu, Kelantan) with an area of roughly 64,057 km2 and ~5 million inhabitants. Furthermore, this region, particularly Kelantan, is primarily rural and recognized as one of Malaysia's least urbanized areas.

Our interdisciplinary team from the Department of Nuclear Medicine, Surgery, and Department of Pathology are in the early stages of establishing a protocol for early-stage breast cancer management in Hospital USM. With the recent SPECT/CT unit installation at Hospital USM, we sought to develop a comprehensive SLNM program using this multimodal approach. We started our first service in 2018 with 1 case only and had accumulated a total of 14 breast cancer patients in 2021 – all had undergone sentinel lymph node removal using this combination technique. The studies conducted in Hospital USM were found to successfully identify the SLNs, which aided in mapping the possible anatomical spread of the disease. Based on this modest experience, we conclude that the coupling of blue dye, radioisotope, and SPECT/CT improves patient management by improving SLN detection, increasing the surgeons' confidence, and minimizing the unnecessary risk associated with radical ALN dissection.

SNLB involving 3 main shooting locations

Houseman Wellbeing Landscape in Malaysia

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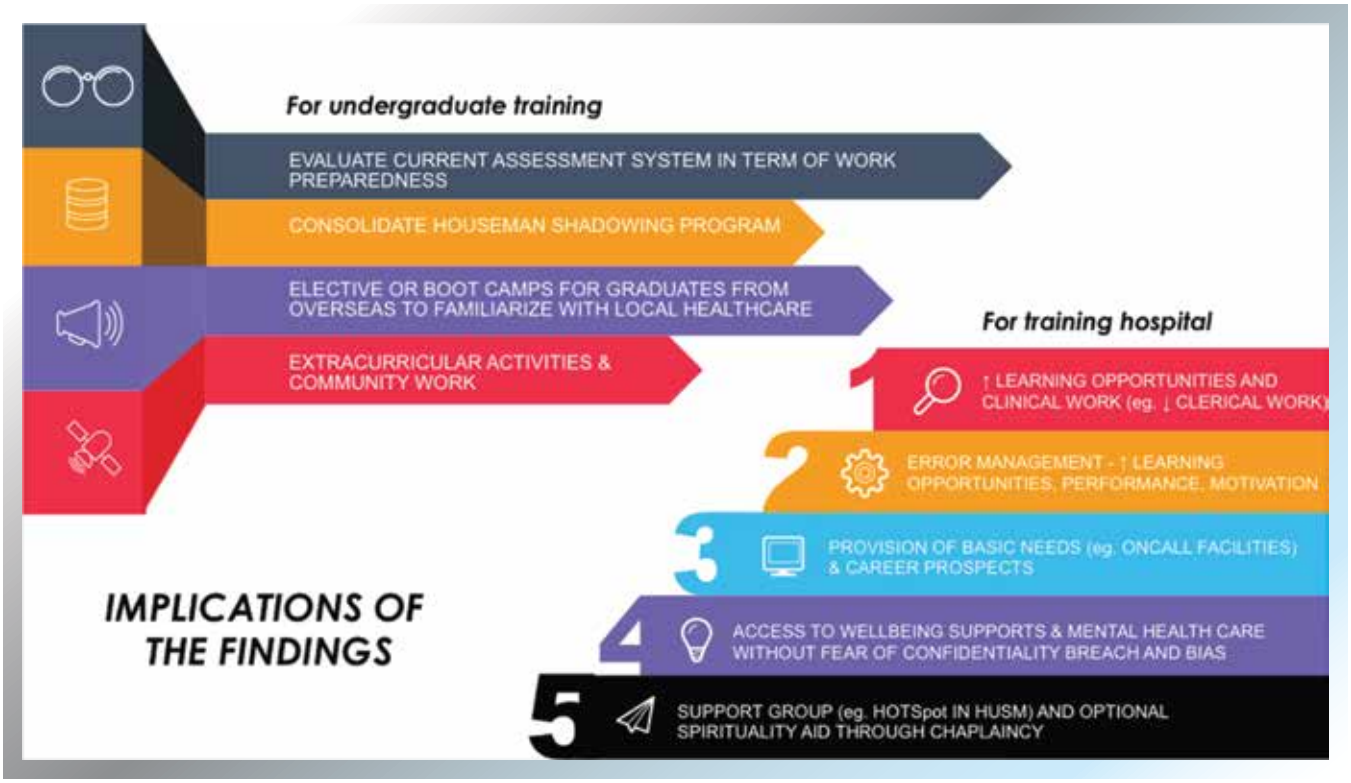
Physicians burnout has been regarded as a public health crisis. A medical intern or houseman is at a higher risk to develop burnout and other mental health problems. As organizational newcomers, they face a challenging transition from undergraduate training to patient care responsibilities. Houseman also has lower job autonomy, placing them in a higher strain category. While there is continuous training to improve houseman knowledge and skills, resilience training is not a common practice, and less is known on a training framework that suits the local training needs. We set out to examine the mental health problems among houseman (burnout, depression, anxiety and stress) and factors that facilitate resilience development in the housemanship context through a mixed-method study (triangulation design).

We examined the prevalence of mental health problems among houseman in ten training hospitals across all six care network zones in Malaysia using five validated inventories (the General Stressor Questionnaire, Copenhagen Burnout Inventory, Depression, Anxiety and Stress Scale-21, Brief COPE-30, Connor-Davidson Resilience Scale). We then conducted in-depth interviews to examine the conceptualization of resilience and its enablers using a piloted protocol with various stakeholders of housemanship training across Malaysia. The study took place from July 2018 to January 2019 and received ethical approval from Universiti Sains Malaysia, Universiti Malaya and the Ministry of Health Malaysia.

Seven hundred fifty-four housemen participated in the survey. The prevalence of personal-related burnout was 73.3%, work-related burnout was 69.1%, and patient-related burnout prevalence was 43.4%. A total of 47.6% of participants had depression symptoms, 60.6% reported anxiety symptoms, and 33.8% had stress symptoms. We found significant associations of mental health problems with several training characteristics and personal demographics. However, lower resilience levels and maladaptive coping were consistently associated with burnout, depression, anxiety and stress. Through 51 interviews, we found that resilience development during housemanship was not only driven by tenacity but also coping skills, support, teamwork, and reflection.

The findings indicate the significant role of resilience and coping as one of the measures to address mental health issues in housemanship training. As resilience is less of a trait and can be developed, the findings can be used to develop an evidence-based training module at the undergraduate and housemanship levels.



Idiopathic Nephrotic Syndrome: Clinical Predictors and Psychological Complications of Its Corticosteroid Treatment in Children

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Idiopathic nephrotic syndrome (INS) is the commonest type of nephrotic syndrome in children, and the majority has favourable outcomes. However, a small proportion of INS would progress to chronic kidney disease (CKD). In our first study, we investigated the time to CKD and the predictive risk factors associated with CKD progression in these children. A retrospective record review was used to investigate the demographic variables, biochemical and histological changes in children with INS aged 12 months to 18 years from 2001-2016 in Hospital Universiti Sains Malaysia (HUSM). The median renal survival time to progress to CKD III or higher was determined using survival curve analysis. Multiple cox regression was used to identify predictive factors for CKD. The total number of participants was 112 (male 71, female 41), and the majority had steroid-sensitive type INS. Ten percent of INS progressed to CKD, stage III or higher, with an overall median renal survival time of 19 years. The median renal survival time in steroid-resistance nephrotic syndromes (SRNS) was 13 years. Focal segmental glomerulosclerosis (FSGS) was predominant in SRNS type. The predictors of progression to CKD were steroid resistance (adjusted HR: 23.8, 95% CI 2.8- 200.9) and the presence of hypertension at presentation (adjusted HR: 8.1, 95% CI 1.2- 55.7). The median renal survival time was comparable to other studies. SRNS type and hypertension at presentation were the main predictors of developing CKD in our population.

The second study was performed to measure psychological problems in children with idiopathic nephrotic syndrome (INS) while on steroid therapy compared to healthy children. It was a prospective cohort study conducted in a paediatric clinic of a tertiary hospital. Parents of participants, both in the INS group and the control group comprising children without chronic illness, were asked to complete questionnaires using the Child Behavioral Checklist (CBCL). CBCL measures a range of age-specific emotional and psychological problems, including internalising and externalising domains. The CBCL scores were analysed between groups using the Mann-Whitney U test. A total of 140 children were recruited with an equal number in the INS and control groups. There was a significant difference in the mean total CBCL scores between INS group children and control group children, specifically in the withdrawal, somatic, anxious, and aggressiveness sub-domains. Similar findings were demonstrated in a correlation between total psychological problems with corticosteroid dosage. Within the INS children, steroid dose and Cushingoid features were found to have a significant positive association with internalising psychological problems. Children with INS on corticosteroid treatment showed increased internalising and externalising scores compared to healthy children.

Data Sharing With Zenodo

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Hamzah Sendut Library is organizing a pilot project related to data sharing with the School of Medical Sciences. The project aims to collect research data in one platform, identify pertinent data to be uploaded, and encourage data sharing practices and collaboration among researchers. Among the expected impact of the projects are to improve visibility of USM research data; to raise awareness of the importance of Open Science practices in research; to support the Open Science initiative at the National level; to improve researcher data management and sharing methods to a systematic, reliable and secure platform for the benefit of all parties; and to preserve the life cycle of research data with systematic and efficient methods. There are various platforms for data sharing. For this project, the team has decided to use Zenodo as a platform for sharing the data.

Zenodo is a multi-purpose open access repository that allows ORCID researchers to upload files up to 50 gigabytes. It was created and maintained at CERN, which is a trustworthy and legitimate public institution. This platform has been chosen as it has been developed and maintained for Open Science and United Nations Sustainable Development Goals practices. In Zenodo, researchers can search for existing data, upload our data, and look for data belonging to any institutional research communities. Researchers may upload and share their data in the relevant communities, and for this particular project, researchers are advised to share through this link URL: https://zenodo.org/communities/usm. In Zenodo, researchers may choose the proper license to their data, such as Open Access, Embargoed Access, Restricted Access, and Closed Access. Among the benefits of sharing the data in Zenodo are it is free to access, it provides digital object identifiers (DOI) for citations, and it will be indexed in another platform such as Google Scholar, Mendeley Data and Dimensions.

Seeing The Unseen

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Health Campus Universiti Sains Malaysia (USM) has faced the COVID-19 Pandemic since March 2020. The USM Framework for response and preparedness plan for COVID-19 Pandemic had outlined seven phases of Pandemic and its response and preparedness plan. The USM Health Campus had experienced the invasion of a nearby community cluster named "Kluster Kubae" into students' hostel, followed by "Kluster Hilir" and "Kluster Banggol Chicha" in the Hospital USM setting. Since then, there have been aggregated epidemiologically-linked cases detected on campus within one incubation period, which indicate the presence of campus community transmission of the disease. This had brought the campus pandemic to the phase 3 early containment response.

The incidence data had shown that the campus cases are influenced by the Kelantan trend of incidence, where it decreased markedly when the movement control order was imposed and increased with the increase of cases in the local community following the Ramadhan and Aidilfitri period. The number of cases had increased markedly in August following the easing of the movement control order and the implementation of the national recovery plan, which allows more mobilization of people across districts. The majority of cases (46%) among campus residence are community infections where the residence was exposed to household and social contacts with local people. Thus, the present standard operating procedures at the workplace and during teaching and learning activities and hostel are vital to prevent local community infection from invading campus and leading to in-campus transmission.

USM Framework for Response and Preparedness Plan for COVID-19 Pandemic, 30th March 2020

Phase	Name	Description
Phase 1	Prevention	An outbreak is declared around the campus geographical location (at state/national level) BUT NO confirmed cases within the campus, either among staff or students.
Phase 2	Control	At least one confirmed case among staff or student, indicating the presence of disease on campus, with possibility of spread within the campus community.
Phase 3	Early Containment	Aggregated epidemiologically-linked cases are present on campus within one incubation period, which indicate the presence of campus community transmission of the disease. This phase can be changed into phase 2 once contacts are confirmed-negative and no new primer case detected.
Phase 4	Late Containment	Spread of disease within the campus is profusely widespread, indicated by an increasing number of new cases.
Phase 5	Mitigation	Verified campus level transmission which is able to sustain within campus. Sustained campus level outbreak in at least one campus or the respective geographical district health office operative area of the campus.
Phase 6	Post peak phase	Reducing number of cases below peak level but has the possibility of recurrent spread.
Phase 7	Post epidemic/ pandemic	Disease activity that reaching endemicity or when national declaration of termination of the epidemic.

Doctors' Write

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COVID-19 is an emerging infection, and there is a rapid expansion of knowledge about the disease. There is a lot of information in social media, however, not all of them are peer-reviewed. Therefore, there is a potential for the public to access wrong information and be misguided. Thus, to overcome the problems, Universiti Sains Malaysia and KPJ have taken the initiative to develop a one-stop credible information centre for medical professionals and our local community. Hence Laman Web Sumber Informasi Perubatan COVID-19 USM-KPJ was proposed. A committee was formed on 9th April 2020, headed by Prof Dr Azidah Abdul Kadir and Prof Dr Rosline Hassan as the advisor. Following that, an editorial board was formed, and reviewers were identified. The website was launched by Pengarah Kampus, Prof Dato' Dr Ahmad Sukari Abdul Halim on the 19th of July 2020. The website can be accessed at this link: *http://covid19.kk.usm.my/*

The articles were written by experts in the medical fields, lecturers, and staff from USM and KPJ. All the pieces are peer-reviewed before being published. Initially, we targeted two categories of people: Medical professionals and the public. Unlike now, during the initial phase of the pandemic, the information and guidelines for Medical Professionals were scattered and rapidly changing. Therefore, it was a learning phase for everybody. Specialists and lecturers write their experience, update guidelines and share their experience with their peers in the Medical Professional columns. As for the public, the articles are written in the Malay language and address local issues and cultures.

Currently, there are more than 400 000 visitors, visit the website. Many of the articles have a good read, the highest hit was more than 90000. We are in the process of producing 2 books about COVID-19 under USM publisher, they are 1) Koronavirus dan COVID 19: Realiti atau Fantasi and 2) Pandemik COVID 19: Impak Kesihatan dan Norma Baru Kehidupan. The books are currently under review.

In conclusion, this platform is an opportunity for experts to write and share knowledge on COVID-19 and help our community access valuable and reliable information on COVID-19.

Hospitalized Covid-19 Patients in Hospital USM: Characteristics, Factors Associated With Mortality, and A Glimpse For The Future

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Hospital USM was initially designated as a non-covid Hospital at the beginning of the pandemic in 2020. However, as the Covid-19 cases in the state of Kelantan increased markedly at the beginning of January 2021, the status of the Hospital changed to a hybrid Hospital, offering both Covid and well non-covid services. Hospital USM's in-patient Covid-19 care kick-started with a 14 bedded (2 ICU/HDU level of care + 12 general care) capacity on January 9, 2021. At the peak of the pandemic in the State of Kelantan in September 2021, the facility has been expanded to reach a 95 bed capacity (17 ICU/HDU level of care + 78 general care), as well as a 17 bed step down care at the Rumah Tamu. A data registry for Covid-19 in-patient was created to record the patients' demographic, clinical parameters, and outcome. A nine-month data was then analyzed by multiple logistic regression to look for associated factors for mortality.

The results showed that the in-patient mortality rate was 11.8%, which is better than that reported in the US National Sample analysis, at 20.3%. Age, the severity of illness at presentation, Ischemic Heart Disease, End-Stage Renal Disease or Chronic Kidney Disease, Diabetes mellitus and Hypertension were all significantly associated with mortality. However, advanced age, diabetes mellitus and the severity of illness at presentation were independently associated with increased mortality. This analysis emphasized that the impact of Covid-19 is not similar for everyone, and it seems clear that those who are older, having underlying illnesses, especially diabetes mellitus and those who are more ill at presentation, are at the highest risk of death from Covid-19. These findings are consistent with those reported elsewhere and suggest that the immediate future remains challenging for those who are clinically most vulnerable despite the efficacy and availability of Covid-19 vaccines.

RESULTS - Clinical Characteristics

CHARACTERISTICS		N	PERCENT OF TOTAL
Days of illness at presentation (Mean)		4 days	-
Category of illness at presentation:			
	Category 1	*73*	*12%*
	Category 2	*164*	*26%*
	Category 3	*139*	*22%*
	Category 4	*179*	*29%*
	Category 5	*66*	*11%*
Morbid Obesity		17	2.7%
Asthma/COPD		42	6.8%
IHD		66	10.6%
Advance CKD/ESRD		71	11.4%
Diabetes		254	40.9%
Hypertension		266	42.8%
Intubated within 24h admission		29	4.7%
Covid-19 mortality (28 days mortality)		73	11.8%

RESULTS - Comorbidities with significant mortality

Comorbidities	Survived	Died	P values
IHD	72.7%	27.3%	<0.001
No IHD	89.5%	10.5%	
Advance CKD/ESRD	69.0%	31.0%	<0.001
No Advance CKD/ESRD	90.2%	9.8%	
Diabetes mellitus	77.2%	22.8%	<0.001
No Diabetes mellitus	95.1%	4.9%	
Hypertension	80.5%	19.5%	<0.001
No Hypertension	93.2%	6.8%	

The Challenges for Undergraduate Teaching and Learning During COVID-19 Pandemic

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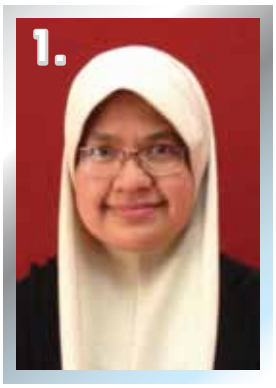
COVID-19 pandemic has led to a "new normal" – a new way we socialise, work, live our lives, teaching and learning. Online teaching and learning have rapidly become the delivery method for higher education in many countries, including Malaysia. Medical education is also not exempted from this new normal. Synchronous and asynchronous online teaching is the method of choice for teaching and learning in medical schools. Video conferencing platforms like Zoom, Cisco Webex, Microsoft Teams, and others have become the platform for these T&L. eLearn@USM has become an essential learning management system in the School of Medical Sciences.

However, the challenges that some medical schools faced were real, like lack of access to the internet or not having adequate skills in using it, and in cultural difficulties, such as solid preferences for face-to-face interaction. Some lecturers even insist that students love face-to-face teaching, even though there is no empirical or proven evidence for this. Our school is fortunate because we received full support from the lecturers to adapt to the changes. However, studies have shown that the attitudes of teachers and learners are strong determinants of the successful implementation of online learning and its effectiveness. Therefore, to ensure the quality of teaching & learning, we have made adjustments to the academic calendar for Academic Session 2019/2020.

Clinical teaching was modified where video communication was used for history taking from actual patients in the wards. In addition, certain departments have assigned clinical lecturers to briefly summarise cases in the ward every morning before starting the synchronous teachings. Clinicians also made their initiatives to conduct online discussions about log-book procedures like blood-taking and ward works.

The online assessment was the method of choice for evaluation. A proper guideline had been compiled to fit the new norm. In addition, live online remote proctoring had been implemented to address the assessment validity threats. In early July 2020, we saw the return of the clinical students to the Health Campus. Since then, the teachings &learnings have been conducted in a hybrid model where only clinical teachings and ward works are conducted face-to-face. Professional examinations for Year 5 were completed in 2020 and 2021, also through a hybrid model. Theory papers were assessed online, whereas short and long cases were conducted in the wards with actual patients.

Live online remote proctoring by the staff during the semester examination



Thank You *to our Emcees*

1. Assoc. Professor Dr. Zaharah Sulaiman
2. Professor Dr. Habsah Hasan
3. Dr. Kueh Yee Cheng
4. Assoc. Prof. Dr. Wong Kah Keng
5. Assoc. Prof. Dr. Muzaimi Mustapha
6. Prof. Dr. Azidah Abdul Kadir
7. Assoc. Prof. Dr. Andee Dzulkarnaen
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9. Assoc. Professor Dr. Wan Faiziah Wan Abdul Rahman

from
- MRP Team 2021 -

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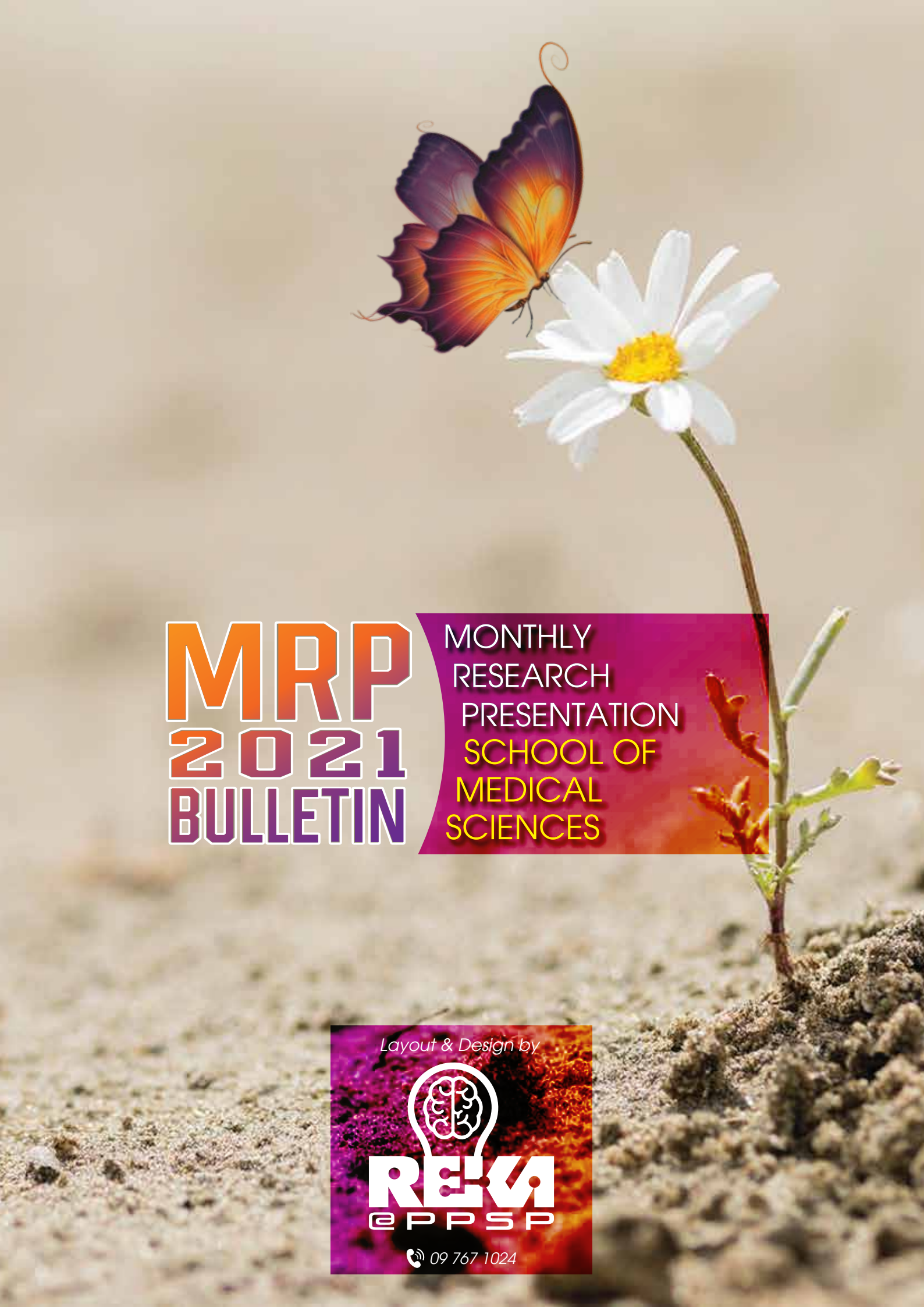

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