

MSPP NEWSLETTER

October 2024



MSPP 2024/2026 President's Welcome Address

Dear Members of the Malaysian Society of Pharmacology and Physiology (MSPP),

It is with great pleasure that we welcome both our newly appointed Executive Committee and all our valued members to another exciting term of growth, collaboration, and advancement. The collective expertise and passion within MSPP continue to be the driving force behind our shared mission to promote excellence in pharmacology and physiology research, education, and practice in Malaysia.

We are confident that our new Executive Committee will bring fresh perspectives and innovative ideas to further enhance our society's impact within our professional community and the broader academic landscape. We aim to build on past successes while exploring new research and public engagement frontiers.

At MSPP, we believe that our strength lies in the active participation of our members. We encourage you to engage with us by contributing your research to our events, sharing your knowledge in workshops, or simply providing feedback and suggestions. Every voice counts in shaping the future of our society.

This year, we have a diverse range of activities planned—conferences, webinars, and collaborative projects—that offer ample opportunities for members to get involved. These activities are not just events, but platforms that can inspire, motivate, and shape the future of our society. We sincerely invite you to take full advantage of these platforms to network, exchange ideas, and showcase your work.

As we embark on this new chapter, let's continue to support one another and work together to achieve our common goals. We deeply appreciate your ongoing dedication and enthusiasm. We look forward to your active participation in MSPP's upcoming initiatives.

Assoc. Prof. Dr. Wan Amir Nizam Wan Ahmad
MSPP President, wanamir@usm.my

MSPP Editorial Message

Dear beloved MSPP members 🤗,

I am delighted to present to you the first issue of our MSPP Newsletter for the 2024/26 term, which is also my last issue serving as the Editor. I have had such an awesome experience in this role, which I assumed since April 2021. Wow, I didn't even realize it has been almost 4 years!! A wonderful 4 years that is! And now it is time to pass the baton to a new Editor. But fret not, I will still be in the picture of course! 😊

Congratulations to the past committee members of the 2022/24 term who has performed outstandingly with numerous activities and programmes. The last event of the term, the 37th MSPP Annual Scientific Meeting 2024 hosted by the International Islamic University Malaysia (IIUM) in conjunction with IIUM's 9th Medical Research Symposium (MRS) held at the AC Hotel by Marriott on the 11th and 12th September 2024 was a resounding success. 🌟 Interestingly, upon the conclusion of the event, MSPP members and participants were left hanging without knowing who will become the host for the next edition. So who will it be? Stay tuned for our exciting announcement of the next host of the 38th MSPP Annual Scientific Meeting 2025! 🤓

The general election was also conducted during the recent meeting to elect the office bearers for the 2024/26 term. Congratulations to the new committee members, led by the president, Assoc. Prof. Dr. Wan Amir Nizam Wan Ahmad who will continue on to steer the society to greater heights. 🚀 I am also humbled to be re-elected into the Executive Committee and we look forward to serve and contribute even more to the society and the field of pharmacology and physiology. Till next time! 🙌

Assoc. Prof. Ts. Dr. Izuddin Fahmy Abu
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Contribute to MSPP
Newsletter by sending your
articles / write-up to
mspp.secretariat@gmail.com



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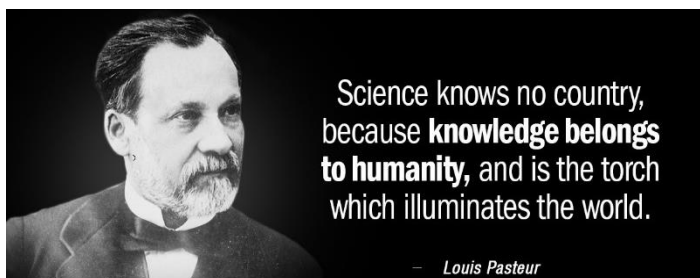
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HISTORY OF THE MSPP

The Malaysian Society of Pharmacology and Physiology (MSPP) started as The Malaysian Society of Pharmacology and Experimental Therapeutics or MASPET which was formed in 1976. The society's membership later-on, expanded to include physiologists, hence the decision to officially change its name to its present state in 1988. It has now become the primary Malaysian-learned society of pharmacologists and physiologists.

Originally based in the University of Malaya, the oldest university in Malaysia, the society plays a key role in promoting research among its members since its early days. The society has been organizing its own scientific meetings as a platform for researchers to share their research findings and build networking and collaborations. The meetings were originally held biennially, however with increasing interest and support, the frequency of the meetings was increased, and has now become an annual event, with the exception during the Covid-19 pandemic.

To date, MSPP is proud to have organized 37 scientific meetings, which were carried out on a rotational and voluntary basis among local universities. The scientific meetings have not only attracted local participants to come and share their knowledge and findings, but have also attracted many overseas participants from countries such as the United Kingdom, India, Pakistan, Iran, Iraq, Indonesia, Kuwait, Nigeria, Australia, Russia and Finland.

Members of MSPP consist of scientists and medical personnel who work in the academia, industry and also healthcare services. The society's scope encompasses a broad spectrum of pharmacology and physiology including the basic and applied aspects of both areas. The society not only promotes research activities but also stresses on the teaching aspect of both disciplines through a series of refresher courses. MSPP also supports and encourages emerging researchers and academicians by conducting the annual Young Investigator and Teacher awards.

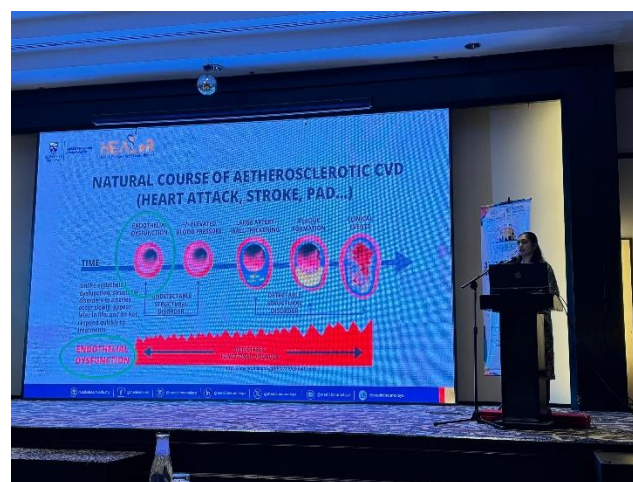
37th MSPP Annual Scientific Meeting 2024

The Kulliyah of Medicine, International Islamic University Malaysia (IIUM) has successfully organized the 37th Malaysian Society for Pharmacology and Physiology (MSPP) Annual Scientific Meeting and the 9th Medical Research Symposium (MRS) 2024, taking place from September 11th to 12th at the AC Hotel by Marriott Kuantan, Pahang. This year's theme, "Integrating Mission-Oriented Research in Medical Sciences," highlights the vital role that mission-oriented research and innovation play in advancing technology and ensuring that such advancements are ethically and socially responsible.

Led by Assoc. Prof. Dr Roslina Abdul Rahim, the organizing committee has curated a scientific program that aims to educate and inspire academic staff and students on the importance of responsible research and innovation in achieving a sustainable future.

It was an honour to host several distinguished speakers on the first day of the event, including Prof. Dr Toshihide Yamashita from Osaka University, and those from IIUM, Prof. Dato' Dr Hamizah Ismail, Prof. Dato' Dr Ahmad Hafiz Zulkifly, Asst. Prof. Dr Mohammad Farhan Rusli, and Assoc. Prof. Dr Maizura Mohd Zainudin. Their talks covered a range of critical topics, such as therapeutic strategies for central nervous system diseases, preserving life and intellect, endothelial dynamics mechanisms, and orthopaedic research.

On the second day, it was a privilege to welcome six more outstanding speakers, Assoc. Prof. Dr Wan Amir Nizam Wan Ahmad (USM), Assoc. Prof. Dr Dharmani Devi A/P Murugan (UM), Assoc. Prof. Dr Azizah Ugusman (UKM), Dr. Florence Pribadi (Universitas Ciputra), Prof. Dr. Zulfaezal Che Azemin (IIUM), and Asst. Prof. Dr Mohd. Hamzah Mohd Nasir (IIUM). They shared their mission-oriented research findings on herbal medicine therapeutics, endothelial dysfunction, Artificial Intelligence in preventive medicine, and the zebrafish therapeutic model.



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This year, 82 participants registered for the conference, coming from academic institutions as well as from public and private hospitals. 95 research abstracts were presented by delegates from IUM, UM, UKM, UPM, USM, UiTM, UniSA, USIM, Monash University, IMU, UCMI, as well as international universities, namely Universitas Ciputra and Universitas Sriwijaya.

The conference awarded three oral presenters, Khairul Akmal Abdul Rahman (UPM), Nabihah Abu Hanifah (IUM) and Nur Khadijah Muhammad Jamil (USIM) free publication award in IUM Medical Journal Malaysia (IMJM).

The organizing committee would also like to thank the sponsors - Nuzha Travel and Tours, Prima Nexus, Kinetic Chemicals, Icon Medic, Medsyn, Thermo Fisher, Novatics, Biomics, IUM Eye Clinic, IUM Dialysis Centre, AC Scientific, and IUM Medical Specialist Centre, for their generous support to the symposium. A special thanks to Prima Nexus for sponsoring an Airtag as the lucky draw prize. May Allah SWT reward all of you for your kindness.



By Assoc. Prof. Dr. Roslina Abdul Rahim
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MSPP Annual General Meeting & Election of Office Bearers for 2024/2026 Term

The MSPP Annual General Meeting (AGM) 2024 was held on the 11th of September 2024 in conjunction with the 37th MSPP Annual Scientific Meeting. The AGM was attended by 22 MSPP members. The election of MSPP office bearers for the 2024/2026 term was also successfully organized. Flip to the next page to know your newly elected MSPP 2024/2026 office bearers.



MSPP Executive Committee 2022/2024



MSPP Executive Committee and auditors 2024/2026



MSPP members who attended the MSPP AGM 2024

MSPP Executive Committee 2024/2026



PRESIDENT

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VICE PRESIDENT

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HONORARY SECRETARY

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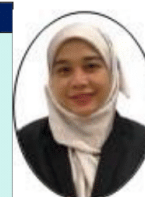


ASSISTANT SECRETARY

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TREASURER

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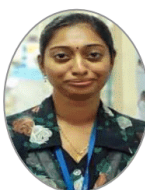


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EXCO

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mechanism of non-alcoholic steatohepatitis (NASH) &
non-alcoholic fatty liver disease, male infertility,
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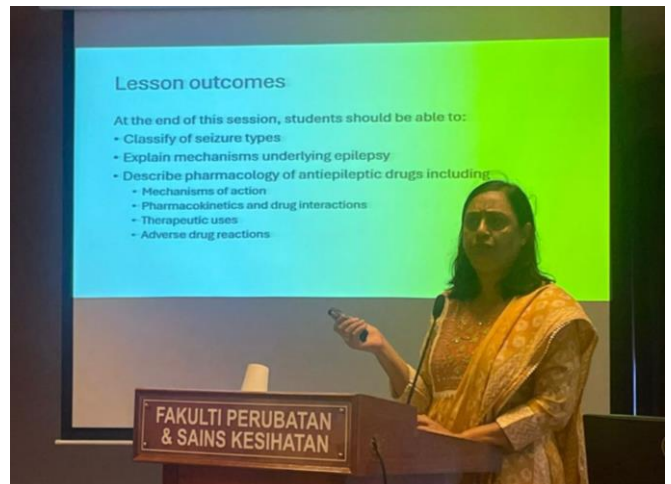
MSPP Refresher Course 2024

On 9th of July 2024, MSPP in collaboration with the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM), successfully conducted the MSPP Refresher Course 2024. The event was held at UPM Serdang and saw the participation of around 30 academicians from various institutions.

The primary objective of the course was to promote and refresh the foundation knowledge of pharmacology and physiology for early-career academicians, to keep abreast with up-to-date and latest developments in these key areas of medical education.

The course featured highly engaging sessions by two renowned speakers:

- Assoc. Prof. Dr. Jaya Kumar Murthy from Universiti Kebangsaan Malaysia (UKM) delivered an insightful presentation on “The Physiology of Substantia Nigra”. Dr. Jaya Kumar highlighted crucial points regarding the neurophysiological functions of this important brain structure and shared valuable teaching tips for making the subject more accessible to students.
- Prof. Dr. Renu Agarwal from the International Medical University (IMU) shared her expertise on “Antiepileptic Pharmacology”. Her session focused on simplifying complex pharmacological mechanisms and provided effective strategies for teaching the topic to undergraduate students, making the content more relatable and understandable.



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Both speakers emphasized the importance of blending theoretical knowledge with practical teaching techniques to ensure that the students not only learn, but also appreciate the relevance of these crucial topics in their future medical practice. The programme concluded with a productive Q&A session, where participants had the opportunity to interact with the speakers, seek clarifications, and discuss various teaching methods.



The MSPP Refresher Course 2024 was a great success, achieving its goal of enhancing the teaching skills and knowledge of academicians in the fields of pharmacology and physiology. Feedback from the participants was overwhelmingly positive, with many expressing appreciation for the opportunity to learn from such experienced educators.



MSPP extends its heartfelt gratitude to the Faculty of Medicine and Health Sciences UPM for co-organizing the event, and to Techman for their generous sponsorship. We look forward to continuing these refresher courses in the future, as part of our commitment to academic excellence and the professional development of Malaysia's medical and health sciences-related educators.

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MSPP Young Teacher Award 2024

The annual MSPP Young Teacher Award was held on the 9th of July 2024, in conjunction with the MSPP Refresher Course at UPM. Four young academicians competed in the Physiology category with the topic “Regulation of Menstrual Cycle”. Meanwhile two emerging lecturers participated in the Pharmacology category with the topic “Hormonal Contraceptives.”

Two winners for the Physiology category were announced; Dr. Farah Hanan Fathihah Jaffar from Universiti Kebangsaan Malaysia (UKM) won first place, while Dr. Zubaidah Hasain from Universiti Pertahanan Nasional Malaysia (UPNM) won 2nd place, bringing home RM500.00 and RM300.00 cash prize, respectively. Dr. Nur Aishah Che Roos, also from UPM triumphed in the Pharmacology category securing RM500.00 cash prize.

The competition was judged by six esteemed academicians, namely, Assoc. Prof. Dr. Yong Yoke Keong (UPM), Assoc. Prof. Dr. Roslina Abd Rahim (IIUM) and Assoc. Prof. Dr. Naguib Salleh (UM) for Physiology category, and YBhg. Prof. Datin Dr. Sharida Fakurazi (UPM), Prof. Dr. Renu Agarwal (IMU) and Assoc. Prof. Dr. Wan Amir Nizam Wan Ahmad (USM) for Pharmacology category.

Congratulations to all the winners!



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GraphPad Prism Workshop

On July 10th, 2024, MSPP in collaboration with the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM), hosted an insightful GraphPad Prism Workshop at UPM. The workshop was conducted by Assoc. Prof. Dr. Wan Amir Nizam Wan Ahmad from USM who guided postgraduate students and academics on the easy and efficient ways to analyze and visualize statistical data using GraphPad Prism software.



A big thank you to all participants for making this event a success. Your enthusiasm and engagement made the workshop truly enriching. Special thanks to UPM for their invaluable support towards co-organizing the workshop.

Here's to advancing our skills and knowledge in data analysis! Stay tuned for more exciting events from MSPP.



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MSPP Membership

MSPP is now 308-members strong! 237 are annual members, and 71 are Life Members. We wish to congratulate our newest Life Members of MSPP as follows:-

Prof. Dr. Zabidah Ismail



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Retired

Prof. Dr. Renu Agarwal



renuag02@gmail.com

International Medical University

Assoc. Prof. Dr. Roslina Abdul Rahim



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International Islamic University Malaysia

Assoc. Prof. Dr. Mohd Heikal Mohd Yunus



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Universiti Kebangsaan Malaysia

MSPP Upcoming Activities & Flagship Events

As MSPP members, you will have the privilege to join and participate in various activities and flagship events. Stay tuned for announcements of the following upcoming activities:-

- MSPP Young Teacher Award
- MSPP Young Investigator Award
- MSPP Refresher Course
- MSPP Webinar Series
- MSPP Workshop Series
- 38th MSPP Annual Scientific Meeting 2025



Member's Teaching Corner: Incorporating Artificial Intelligence into the Teaching & Learning of Medical Human Physiology

Comprehending the complexities of anatomical structures and physiological systems are vital in the field of medical human physiological. For years, this intricate subject has been exposed to students through lectures, textbooks, and hands-on laboratory practical sessions. Although these teaching & learning (T&L) methods are essential, the use of artificial intelligence (AI) technologies could completely transform how medical students grasp and engage with physiological concepts.

AI-assisted tools, such as the immersive metaverse simulations and predictive result analytics are facilitating a transition from passive to active learning. These systems have the capability to offer instant feedback, adjust to individual student's pace of learning, and facilitate a more interactive, hands-on method, in order to grasp the complex human physiological processes.

AI's significant role in educating human physiology in medicine lies in its capability to provide individualized learning experiences. AI systems have the ability to assess students' advancements, and customize the coursework based on their curriculum requirements. If a student finds it difficult to learn and understand the cardiovascular physiology, an AI-powered platform can suggest extra materials, simulations, or customized exercises to assist the student to better understand the concepts.

The immersive metaverse simulation, for example augmented reality (AR) or virtual reality (VR) have the ability to simulate the movement of blood in the cardiovascular system or the electrochemical processes in the nervous system, allowing students to engage with these systems in a manner that 2-dimension (2-D) textbooks or traditional lab models cannot offer. These tools aid in connecting theoretical knowledge with practical use, ensuring that students develop a deeper, hands-on grasp of physiology.

Along with personalized learning and simulations, AI is also beneficial for assessments and evaluations. AI-powered evaluation tools have the ability to assess progress in both formative and summative ways, offering instant feedback to students regarding their grasp of essential physiological principles.

For the physiology educators, by utilizing the enhanced AI technology, they could observe and analyze the academic trends in



students' performances, allowing them to tailor their teaching approaches accordingly. AI can analyze misconceptions, difficult topics, and learning trends in a whole group due to its capacity to handle vast amounts of data. This doesn't just boost individual students' achievements but also enriches the overall T&L method in every cohort.

Even though incorporating AI into the medical human physiology curriculum offers many benefits, there are also obstacles and challenges that comes with it. Educators need to consider the high cost nature of AI tools, the need to verify and validate the AI system accuracy, and the risk of excessive dependence on technology. The need to balance between the benefits and the risks are inevitable.

Lastly, it is crucial to consider ethical issues regarding data privacy and the influence of AI on the educators and students dynamic. While AI can enhance the T&L experience, it is important for it to supplement rather than supplant the human nature and elements in medical training, particularly for medical human physiology subject.

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Member's Research Corner: Chronophysiology is an Important Area in the Challenging Modern World to Sustain Health

Chronophysiology, the study of biological rhythms and their impact on physiological processes, has gained significant attention in recent years due to its potential implications on human health in our modern, fast-paced world. This field explores how internal biological clocks regulate various bodily functions and how external factors, such as light exposure and social schedules, can influence these rhythms.

One key aspect of chronophysiology is the circadian rhythm, a roughly 24-hour cycle that governs numerous physiological processes, including sleep-wake cycles, hormone secretion, and metabolism. Disruptions to this rhythm, often caused by factors like shift work, jet lag, or excessive exposure to artificial light at night, can have profound effects on health.



The CLOCK (Chronobiology, Lifestyle, & Optimal Circadian Knowledge) team that integrates researchers from USIM, UiTM and UniKL, has contributed to our understanding of chronophysiology and its relevance to public health. In one of their works, Juliana et al. (2022) stated that, *circadian misalignment that influenced sleep quality is the important predictor that led to mental and physical health issues*. This highlights the importance of considering individual differences in circadian preferences (chronotypes) and the misalignment between biological and social time (social jetlag) when addressing health issues.

Whilst we are busy handling the current situation of aging community in our nation, it is imperative to note that the modern world presents unique challenges to our biological rhythms, including:

1. Increased exposure to artificial light, especially blue light from electronic devices.
2. Irregular work schedules and shift work.
3. Global travel leading to frequent jet lag.
4. 24/7 availability of food and entertainment.

Understanding chronophysiology can help in developing strategies to address these challenges. One such strategy involves considering chronophysiological factors in 24-hour nutritional intake to ensure optimal chrononutrition. As Juliana et al. (2023) suggested, *emphasizing the importance of healthy and timely eating habits among young adults is crucial, as data shows they tend to engage in poor chrononutrition practices. This is likely because their body weight is less affected by irregular eating patterns at this stage of life. However, these habits often persist into later life, and are hypothesized to contribute to the rise in metabolic disorders.*

In conclusion, chronophysiology offers valuable insights into maintaining health in our modern world. By understanding and respecting our biological rhythms, we can potentially prevent various health issues and improve overall well-being. Further research in this field, will be crucial in developing effective strategies to align our lifestyles with our internal biological clocks.

The core members of CLOCK research group are comprised of:

1. USIM - Norsham Juliana, Sofwatul Mokhtarrah Maluin, Nazefah Abd Hamid, Marjanu Hikmah Elias
2. UiTM - Nur Islami Mohd Fahmi Teng
3. UniKL - Izuddin Fahmy Abu

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2. Juliana N, Azmi L, Effendy NM, et al. Effect of Circadian Rhythm Disturbance on the Human Musculoskeletal System and the Importance of Nutritional Strategies. *Nutrients*. 2023; 15(3): 734. <https://doi.org/10.3390/nu15030734>
3. Juliana N, Teng NIMF, Hairudin KF, et al. Chrononutrition behavior during the COVID-19 pandemic and its relationship with body weight among college students. *Front Nutr*. 2023; 10: 1079069. <https://doi.org/10.3389/fnut.2023.1185154>

Member's Opinion: The Need to Include Serum Leptin Levels and Markers of Inflammation in the Diagnosis and Classification of Obesity

The World Health Organization (WHO) estimates that almost a quarter of the world's adult population is either overweight or obese [1]. What is more alarming than this is that this fraction is likely to increase over the foreseeable future [2], and with it too the prevalence of non-communicable diseases (NCD).

Obesity has long been recognised as a risk factor for NCDs like high blood pressure, ischaemic heart disease, atherosclerosis, diabetes mellitus, chronic respiratory diseases, some types of cancers, dyslipidaemia, and fatty liver disease. However, in 1997, the WHO, and quite rightly too, declared obesity as a disease in its own right. Both the American Medical Association and the European commission also followed suit a few years later, with the former defining it as a chronic condition with multiple pathophysiological aspects and complications [3]. Recent evidence has also linked obesity with mild cognitive impairment, altered hippocampal structure and function, Alzheimer's type dementia, autonomic and somatic nervous system dysfunction, and to some obstetric, reproductive, perinatal and pelvic disorders. Clearly, obesity is a disease that is responsible for countless human ailments.

Despite it being declared a disease, its diagnosis is still largely based on body mass index (BMI). The WHO defines a BMI of between 25 and 30 kg/m² as overweight, and that greater than 30 kg/m² as obese. This criteria is grossly inadequate for the diagnosis of obesity as a disease. More relevant and sensitive criteria are required to help in the management and prevention of obesity-related complications. BMI used for the diagnosis of obesity have inherent limitations and weaknesses. BMI or the measurement of percentage body fat do not reflect or detect the silent or insidious pathological changes taking place inside the body of the overweight and obese individuals. Besides that, BMI does not directly estimate body fat, and cannot differentiate between lean and fat mass in the body.



Skinfold thickness using a skinfold calliper only measures subcutaneous fat, and does not accurately reflect the total percentage of body fat. Bioelectrical impedance analysis (BIA) for the measurement of body composition and body fat percentage is influenced by factors like hydration status, food consumption and physical activity. The accurate methodologies for the measurement of fat mass like dual X-ray absorptiometry and hydrodensitometry are too expensive to be performed in a clinical setting.

Measuring body fat alone is not sufficient to confirm obesity as a disease. Obesity is a state of low-grade inflammation associated with adipocyte dysfunction. The precise relationship between BMI or percentage body fat and inflammation is still unclear. Measurements of BMI and/or percentage body fat on their own do not reveal the state of the inflammation. The exact point on the BMI scale or percentage body fat at which inflammation begins is not known. The exact cut-off point at which excess body weight becomes a disease has yet to be identified. We need to identify a marker(s) and its serum concentration that will provide us with the cut-off point at which excess body weight becomes a disease. In addition, we also need to know if this particular cut-off point is the same for all individuals including adults and children of all races, and whether there are gender differences [4]. The factors that influence this cut-off point need to be identified too. Whether regular physical activity impacts this cut-off point remains to be established. Moreover, and equally important, the precise factor(s) and the mechanism responsible for the systemic low-grade inflammation in obesity has to be established.

The current available evidence points to the distressed adipocytes in obese individuals as the major source of a factor(s) released into the circulation that is responsible for the systemic inflammation. One of the factors that could act as an ideal marker for the diagnosis of obesity is leptin. The over-stretched, distressed adipocytes in the white adipose tissue of obese individuals secrete larger amounts of leptin, together with a number of other pro-inflammatory cytokines. In fact, serum leptin levels correlate positively with percentage body fat. Being a pro-inflammatory adipokine, leptin is known to cause widespread endothelial activation.

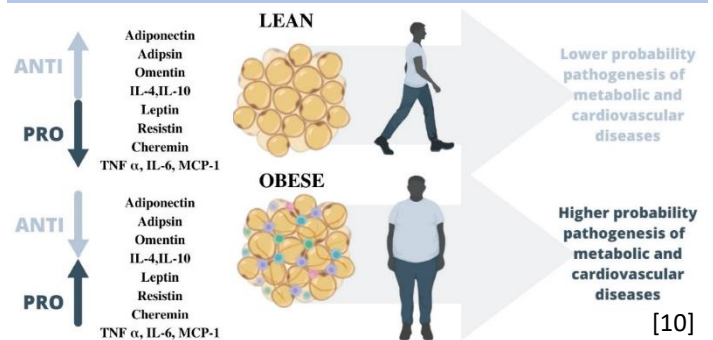
Besides increased leptin secretion, raised BMI has also been found to disrupt the chromatin accessibility in human adipocytes, which could underlie obesity-related inflammation [5]. Leptin may have a significant impact on the DNA of cells. In this regard, studies in our laboratory have shown that leptin alters the expression of over 5000 genes, including apoptosis-inducing factor, histone acetyl transferase, respiratory chain reaction enzyme, cell necrosis and DNA repair genes. It also downregulates antioxidant enzymes and upregulates tumorigenic genes [6-8].

Apart from the increased secretion of leptin and other pro-inflammatory adipokines, the death of some of the distressed adipocytes within the adipose tissue increases the recruitment of macrophages into the adipose tissue. Some of these macrophages get polarized into pro-inflammatory M1-like macrophages and begin to secrete many pro-inflammatory cytokines, including TNF [9]. It seems that the raised circulating levels of leptin and other pro-inflammatory adipokines are the most likely factors responsible for the chronic low-state inflammation in the obese, and their measurement could certainly help improve the diagnosis of obesity.

Whilst it is important to know the exact fraction of body fat, but as stated earlier, accurate measurement of percentage body fat in itself does not automatically confirm the presence of disease. There are those individuals, albeit a few, with BMIs of above 30 years of age and percentage body fat greatly exceeding the normal range, live to be 80 years or more without any major health complaints. What we, therefore, need are parameters for the detection of altered or disturbed adipocyte function or dysfunction in overweight and

obese individuals together with those indicating endothelial activation and generalized inflammation.

Adipocytes produce a large number of adipokines and cytokines, which, under normal circumstances, serve numerous physiological functions, including regulation of energy balance and body weight, immune function, and reproduction [10,11].



Some of these adipokines are pro-inflammatory and some are anti-inflammatory, and the secretion of these is drastically altered in obesity where the secretion of pro-inflammatory adipokines is upregulated whereas the secretion of anti-inflammatory adipokines is down-regulated [12,13]. The hypertrophy of adipocytes in and around the viscera, exacerbates hypoxia within the adipose tissue leading to metabolic dysfunction in the adipocytes and dysregulated differentiation and maturation of preadipocytes, and even death of some of the adipocytes [12]. This altered internal milieu within the adipose tissue results in increased secretion of pro-inflammatory adipokines like leptin, TNF-alpha, IL-6, resistin, chemerin, visfatin, PAI-1, RBP4, lipocalin 2, IL-18, ANGPTL2, CCL2, CXCL5 and NAMPT, and decreased secretion of anti-inflammatory adipokines like adiponectin and SFRP5 in obesity. As mentioned earlier, it has long been established that serum leptin concentration is directly proportional to the adipose tissue mass. Released constitutively, the secretion of leptin increases further when the adipocytes are hypoxic or distressed. The pro-inflammatory and cell proliferative activities of leptin have also been well documented [14-16]. Incidentally, leptin is also believed to mediate the relationship between blood pressure and fat mass [17]. Leptin injections into rats and mice result in increased blood pressure, proteinuria and serum levels of markers of endothelial activation [18-20]. Measurement of serum leptin levels could provide an ideal diagnostic parameter for obesity.

Based on the information that is available, it is evident that we need a set of tests that will specifically identify the inflammatory state associated with increased adipose tissue mass. We cannot just rely on BMI or the fraction of body fat for the diagnosis of obesity as a disease. The measurements of these inflammatory parameters will help in identifying the disease a lot earlier; perhaps long before its cardiovascular and metabolic manifestations become apparent. Measurement of pro-inflammatory adipokines like leptin and cytokines like IL-6, and TNF-alpha, and serum levels of markers of inflammation like C-reactive protein (CRP) and markers of endothelial activation (e.g., endothelial adhesion molecules such as ICAM, VCAM, e-selectin etc.) are necessary for the diagnosis of obesity. It is very likely that changes in these parameters may be evident even at BMIs below 25 or between 25 and 29 kg/m². As we already know that cardiovascular and metabolic diseases also affect individuals in the borderline and overweight population and not just those who are obese.

Clearly, the currently used BMI classification of overweight and obesity needs to be re-visited and revised based on the level of adipocyte dysfunction and inflammation if we wish to manage obesity as a disease. Like with many other diseases, early diagnosis of obesity is important for the prevention of obesity-related diseases, that are fast becoming a burden to the healthcare systems of most countries. Measures have to be put in place to reduce the prevalence of obesity in the community. These include education in schools and all institutions of learning on the importance of a balanced nutrition and regular physical exercise in the maintenance of normal body weight. Incentives and facilities should be created or provided in workplaces for employees to become more aware of the dangers of being overweight and obese, and special rewards for keeping their body weight within the normal range. Obesity in most instances primarily stems from poor nutrition and low physical activity. Food has become a very important component of our social behaviour and we consume food even when we do not need to. We really need to learn to eat to live rather than living to eat, which is what we are doing at the present time.

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Malaysia's Obesity Scorecard (World Obesity Atlas, 2022)



Malaysia

ADULTS WITH OBESITY BY 2030

23.4%

HIGH

ADULT OBESITY IN 2030

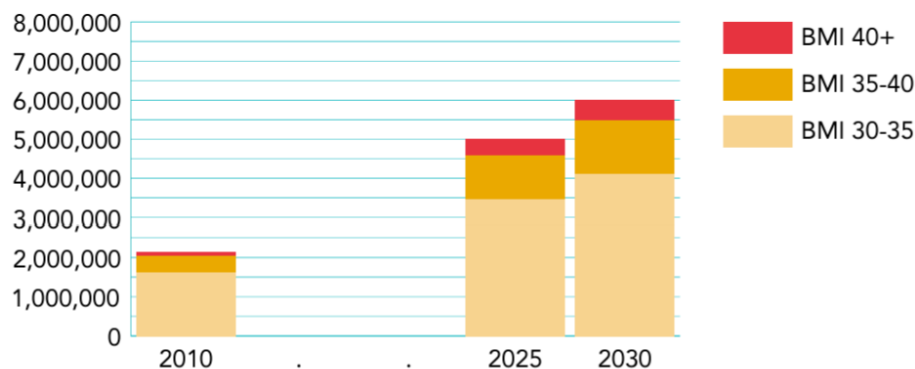
		BMI ≥30	BMI ≥35	BMI ≥40
MEN	Prevalence (%)	20.55	5.37	1.38
	Total number	2,698,544	705,073	181,401
WOMEN	Prevalence (%)	26.36	9.47	2.78
	Total number	3,316,515	1,191,288	349,692

GLOBAL PREPAREDNESS RANKING

55/183

FAIRLY GOOD

NUMBER OF ADULTS WITH OBESITY



ANNUAL INCREASE IN ADULT OBESITY 2010-2030

3.3%

VERY HIGH

ANNUAL INCREASE IN CHILD OBESITY 2010-2030

4.0%

VERY HIGH

CHILD OBESITY IN 2030

Age	5-9	10-19
Prevalence (%)	24.89	20.04
Total number	660,159	1,036,827

PREMATURE DEATHS FROM NCDs AS % OF ALL NCD DEATHS

48.4%

HIGH

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NCD Risk Factor Collaboration, with permission, rights reserved. Projections by World Obesity

DALYs and deaths
Institute for Health Metrics and Evaluation Global Burden of Disease database, with permission, rights reserved.

NCD premature deaths:
World Health Organization Global Health Observatory, with permission, rights reserved.

Obesity-NCD preparedness
calculated from multiple metrics (see Appendix 1, World Obesity Atlas 2022).

Source: World Obesity Atlas (2022). World Obesity Federation. London: 2022. https://s3-eu-west-1.amazonaws.com/wof-files/World_Obesity_Atlas_2022.pdf