ABSTRACT BOOK

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Academician / Postgraduate Students

Practice Makes Perfect!!: Clinical Pharmacokinetic Case Studies Workbook

Nur Wahida Zulkifli[1]*, Kamaliah Md Saman[1], Farhana Fakhira Ismail[1], Nor Elyzatul Akma Hamdan[1], Hannah Abdul Halim[2]

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Abstract

Clinical Pharmacokinetics is usually the course that undergraduate pharmacy students are most afraid of. Before taking this course, approximately 92 % of 150 students believed that it was interesting but difficult to understand. Students believe that this course requires them to calculate the dose using a formula and understand the clinical aspects of the patients before making any recommendations. According to previous students (n=167) who took this course, approximately 64.7 % said it would be great if there was a calculation using a workbook like an e-book that contained real cases. Therefore, the goal of this research is to create a workbook for students that includes real-life scenarios. The Pharmacy Department at Hospital Kuala Lumpur assisted us in gathering information and case studies for this project. The case studies were designed using the CP2 form. The CP2 form is a form that is used by a pharmacist practitioner in the hospital. The advantages of this innovation are as follows: (1) able to make students familiar with clinical pharmacokinetic cases; (2) practice calculations and understand the rationale behind it; and (3) able to provide relevant recommendations and individualised based on patients' progress. The workbook could then be commercialised and distributed to other universities. Moreover, our plan is to print this workbook into a hardcopy. Therefore, for the next semester students can use it during the learning session and practice the calculation. In addition, this module can also be added to Massive Open Online Courses (MOOCs), which are free online courses that anyone can participate in. As a result, it can be commercialised for other university students not only in Malaysia, but also elsewhere in the world.

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Thalasse-B – The Rapid Detection Kit for Thalassemia Gene Markers

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Abstract

Thalassemia is a hereditary blood disorder characterised by the abnormality in the production of α- or β-chain of haemoglobin that results in a phenotype ranging from severe anaemia to clinically asymptomatic individuals. About 4.5% of the total Malaysian population are carriers for β-thalassemia which is currently a health problem affecting Malaysians. Mutation in the *beta globin (HBB)* gene leads to this health problem. α-thalassemia have also been reported to be present in Kadazan ethnics and Malays. Allele of β-thalassemia *Cd 41/42 –TTCT* is common in Malay and Chinese Malaysian. The α-thalassemia marker -$\alpha^{3.7}$ was reported to be high amongst the Malay. Thalassemia gene markers can be diagnosed via genetic analysis. Usually, the genetic analysis used polymerase chain reaction (PCR) based method which can be a complicated technique and expensive. A more efficient detection platform based on the recombinase polymerase amplification (RPA) and a lateral flow dipstick (LFD) was developed for the detection of *Cd 41/42 –TTCT* and -$\alpha^{3.7}$ alleles in the *HBB and HBA* genes. Under the isothermal incubation temperature, specifically, 10 minutes at 37°C for RPA followed by 10 minutes at room temperature for LFD, the detection kit was found to be simple and sensitive with the fast turn out. Furthermore, this detection kit is suitable for being used not only for laboratory but also for "on-site" detection in low-resource environments because of its simplicity and portability.

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Design Effective for Kratom (*Mitragyna speciosa*) As Art Therapy by Using Additive Manufacturing

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Abstract

Kratom is a tropical tree with a height of 4 to 16 metres that is native to Southeast Asia, the Philippines, and New Guinea, but is now grown overseas. The tree and leaf preparations from it are known as *ketum* in Malaysia. Kratom leaves are typically chewed or used to make tea; they are rarely smoked. Kratom has stimulating effects at low doses and is used to fight weariness during lengthy workdays. However, it can have sedative-narcotic effects at high doses. As an alternative to opium in conventional medicine, kratom is now widely regarded as a prohibited substance that, when taken improperly for recreational purposes, can be harmful to both the user and others. The rapid advancement of printing technology can shift the focus of digital art toward the creation of physical goods by utilising kratom's properties that have been customised for these products. After the conclusion of this research, a beginning strategy for future mindset transformation will be produced using additive manufacturing technology in the form of art therapy goods.

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HRS Mucilage: A Multifunctional Excipient for Pharmaceutical Applications

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Abstract

Mucilage is a complex heteropolysaccharide. It is highly viscous with a slimy appearance when in contact with water. The mucilage obtained from *Hibiscus rosa-sinensis* (HRS) is a novel source of polysaccharides. This project focused on skin barrier modification for transdermal drug delivery and wound healing effects of HRS mucilage. Dried-powdered mucilage was extracted from the fresh leaves of HRS. Three concentrations of HRS mucilage were formulated into HRS gels, specifically 1, 1.5, and 2 %(w/w), using caffeine as a model drug. HRS mucilage in the form of a gel altered the barrier and permeability of skin by perturbing the lipid and protein structures, acting on the helical keratin filaments as well as through the O–H and/or N–H interactions. These then reduced the diffusional resistance for drug transport and increased the drug permeation. Additionally, based on the *in vivo* wound healing study using Sprague Dawley rats, HRS mucilage in thin films are able to promote wound healing in partial-thickness burn injury. The rats treated with HRS mucilage exhibited a remarkably smaller wound size and a higher rate of re-epithelialisation than untreated rats. The optimal concentration of HRS mucilage at 2 %(w/w) was deemed useful in facilitating drug permeation and hastened the wound healing process.

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NursYT – Virtual Clinical Teaching

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Abstract

In March 2020, the academic nursing programme made the difficult decision to remove students from clinical practicums due to COVID-19. While most learning is conducted online, students in the Nursing Programme must complete practicals at nursing skill labs to fulfil the Bachelor of Nursing degree requirements set by the Malaysian Nursing Board. Thus, our team has developed an open educational resource: a YouTube channel named "Nursing UiTM" or "NursYT". The primary aim of this channel is to educate students and the general public on step-by-step nursing procedures. Since its launch in May 2020, the Nursing UiTM channel has received positive reviews and feedback from viewers. To our knowledge, this is the first video compilation available in the Malay language and presented based on local nursing practices. In the long term, the video compilation will help future nursing students understand various nursing skills and procedures.
"Great Initiative" – Emily Dorothy Peter, a viewer of the Nursing UiTM YouTube channel.

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Fungo-Tx® FFG: Advanced Film-Forming Antifungal Gel

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Abstract

Higher treatment failures (40-60%) and recurring dermatophytosis infection (22.2% after 3 years) raise the issue of the effectiveness of antifungal medications on the market. Current antifungal preparations are in the form of creams, lotions, and shampoos. However, these preparations have poor persistent contact with the site of treatment, which is easily removed after application, poor drug permeability, and compromised patient compliance due to the messiness, stickiness, and interference with daily activities that contribute to no cure and/or to the development of resistance. Fungo-Tx® film-forming gel (FFG) is our secret formulation in a gel during storage. This topical gel earns our top spot for its unique formula that converts its gel form into a film *in-situ* upon application to the infected site. These criteria offer benefits in terms of masking and/or while continuously delivering drugs to the affected site and not being removed from the site by clothing, gauze, etc. Our recent study published in the International Journal of Applied Pharmaceutics revealed that Fungo-Tx® FFG dries in less than a minute, is non-sticky, and forms a transparent film on the skin. The forming film stays on the skin, is highly flexible, and facilitates drug permeation across the stratum corneum to elicit positive clinical outcomes. Fungo-Tx® FFG is easy to apply and efficacious, with a comparable effect to a proprietary drug, Terbex® (1% w/w terbinafine HCl, Beximco Pharmaceuticals Ltd). Fungo-Tx® FFG is a novel delivery system for topical antifungal delivery to treat dermatophytosis with good patient acceptance for improved compliance. Overall, it is efficacious, safe, and satisfies pharmacopeial standards for product stability and is in line with the Malaysian Action Plan on Antimicrobial Resistance (MyAPAMR) 2017–2021 and WHO Sustainable Development Goal 3 to ensure healthy lives and promote well-being for all.

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Phoenix Anti-Acne Cream
(A cream containing *Phoenix dactylifera* fruit extract)

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ABSTRACT

Acne frequently makes a person feel obnoxious, making it difficult for them to even look people in the eye. Acne is brought on by four factors: excessive sebum production; clogged hair follicles by sebum and skin cells; inflammation followed by bacterial infection. Therefore, it can be prevented by applying cosmetic products that tackle the causes of its formation. *Several studies have shown that Phoenix dactylifera, or date fruit extract, has anti-microbial and anti-inflammatory bioactivities.* Considering a pile of date fruit stocks left post-Ramadhan month, the idea of utilising them has emerged, which consequently prevents them from spoilage and waste. The date fruit was extracted by using ultrasonic-assisted extraction with 95% aqueous ethanol. The extract was then tested for its anti-microbial activities by using the Kirby-Bauer disc diffusion method against *Escherichia coli, Psuedomonas aeruginosa* and *Staphylococcus aureus.* The results showed that date fruit extract inhibits microbial growth, with the zone of inhibition ranging from 0.6–0.8 cm. In this regard, this project is producing an anti-acne product containing 4% of the extract. The cream was characterised and showed that the cream formulated was non-sticky, homogenous, and white in colour with a pleasant rose scent. The pH was 5.2 ± 0.04 which was within the range of physiological skin pH. The spreadabiity test exhibits good spreadable properties, and lastly, for the microbial limit test, both total aerobic microbial count and total yeast and mould count showed acceptable results. Several limitations of this study must be highlighted in which further study on the anti-inflammatory and anti-oxidant activities of the extract must be conducted to confirm its bioactivities. As for the cream formulation, further stability studies should be done to estimate the shelf-life and to make sure it is stable and viable to be marketed.

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Interactive Infographic with QR Code to Promote Information on Correct Administration of Solid Oral Dosage Form

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Abstract

Dosage form manipulation is usual in paediatric practise to obtain the required dose for the patient. Previously, we selected a post from Facebook page pertaining to solid oral dosage manipulation and carried out a content analysis of the online discussion. It was found that difficulty swallowing large-sized pills is one of the major issues discussed. Furthermore, parents resort to forcing their kids or crushed the tablet to facilitate the swallowing without consulting health care provider. We presented the findings during PHC632 research presentation and concluded that promoting facts about undesirable effects of drug manipulation and correct oral drug administration is important. Therefore, an infographic was designed to address the issue. Infographics have been reported to be preferred over plain text. Additionally, a YouTube link and Kahoot quiz were embedded in QR codes to produce an interactive infographic. Although currently the project relies on Kahoot and video from other resources on YouTube, the infographic content and interactive activities are designed based on findings obtained from our previous content analysis study, which found a demand from the public to increase their awareness, especially among parents, about the correct administration of solid oral dosage form.

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Private Clinic: Identity and Image in Design to Support Rural Communities

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Abstract

The design of a clinic is very important and should be emphasised to provide comfort for patients. However, currently, the existing design in clinics does not provide full comfort to the users and patients due to the impracticality, unergonomic, and unevolved designs. Aware of the need and importance of an attractive design in a clinic; therefore, a new identity and image of a new private clinic in a rural area is proposed. The collaboration among several experts in design and decoration has successfully projected a renewed design concept. The combination of both interior and exterior decoration holds its own identity and uniqueness in attracting the attention of the local community. Among the elements researched are manufacturing, materials, and design. The design of this private clinic is an Islamic concept, emphasising important elements such as ergonomics, lighting, and workspace. Both physical and psychological elements are scrutinised to welcome patients or rural communities that come from various backgrounds and career landscapes. The latest materials such as steel, polyvinyl chloride (PVC) board, glass, concrete, and wood are used in the interior design as well as the exterior of a premises. It aims to welcome and provide comfort to the rural community, enabling them to experience the best health services while at the clinic. The proposed design covers all areas in the clinic, including a waiting room, treatment rooms or consultation rooms, toilets and other spaces available. The design of this clinic will not only open a new chapter in producing interior and exterior design for health premises; it will also provide a first-class atmosphere in welcoming rural communities to enjoy their own comfort while getting treatment at Mediklinik Al Waleed, Sungai Limau, Yan, Kedah.

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Cool-It Melon Nano Lotion.

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Abstract

Watermelon white rind is considered the most underutilised watermelon fruit resource as it is usually discarded as waste due to its unappealing flavour. Utilizing watermelon rind by generating new products could decrease the amount of biological waste, thus recognising the rind's potential economic value in various industries, mainly in food and cosmeceutical industries. Therefore, this study was aimed to determine the potential cosmeceutical product in lotion dosage form incorporating watermelon rind extract as a natural and low-cost ingredient. The phytochemical analysis of rind extract identified containing antioxidants, phenolics, flavonoids and others. The optimum lotion formulated with pH value 4.7, viscosity 1.32 Pa, water activity 1.42 aw, and spreadability of 26.7 g.cm/s gave the nearest value compared to the standard commercial formulation. The droplet morphology of lotion was constant below the 20 nm size range, indicating the appearance of nano-emulsion. The stable lotion formulation was successfully formulated with more than 1-year stability and has commercial value at the Technology Readiness Level (TRL) 7: System prototype demonstration in the operational environment.

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An *In Silico* Tool Based Strategy for the Development of Novel Products for Onychomycosis

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Abstract

Onychomycosis is a prominent fungal infection that causes discoloration, thickening, and mutilation leading to the separation of the nail from the nail bed. Treatment options may include oral, topical, or combination therapy with anti-fungals, sometimes chemical or surgical intervention. To deal with the associated challenges novel products have been developed that also employ *in silico* tools. Molecular docking-based drug selection taking keratin as target protein may be a better option. Ciclopirox, Amorolfine HCl, Efinaconazole, Tioconazole, and Tavaborole were selected for the study, concluding Amorolfine HCl is the best option. From the selected drug two formulations (Nail lacquer-NL and nanoemulgel- NEG) were developed to validate the *in-silico* screening outcomes. The formulations were further fortified with over-the-counter ingredients vis-a-vis with Vitamin E in NL and Undecylenic acid (as an oil phase) in NEG for their prominent roles in improving nails health. Thioglycolic acid was taken as a penetration enhancer in NEG. For NE the quality parameters were particle size, the zeta potential (78.04 ± 4.724 nm and −0.7mV, respectively), *in vitro* cumulative drug release (96.74% for NE and 88.54% for NEG), and transungual permeation (about 73.49% for NEG and 54.81% for NE). Nail lacquer was evaluated for the drying time, non-volatile content, and blush test. *In vitro* cumulative drug release of the developed nail lacquer and comparator marketed formulations were around 81.5% and 75%, respectively. Similarly, the transungual drug permeation was 6.32 µg/cm^2 and 5.89 µg/cm^2, respectively, in 24 h. Our hypothesis of using *in silico* technique for drug selection appeared viable option, which was validated in two novel formulations- NL and NEG. Addition of some established ingredients for nail health further increases the efficacy. The hypothesis should further be validated in suitable animal model and clinical studies.

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A Validated Questionnaire on Immunosuppressive Medications Knowledge in Post Kidney Transplant Recipients: Item Generation & Initial Validation

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Abstract

Kidney transplant recipients (KTR) are being prescribed with long-term immunosuppressants (IS) to prolong graft survival. Knowledge of immunosuppressants among kidney transplant recipients is still sub-par. Studies have demonstrated that patients with better knowledge of immunosuppressants have higher adherence to medications and a better quality of life. Knowledge of immunosuppressants is an important determinant of adherence and quality of life. The prevalence of non-adherence to IS among KTR ranges between 2% to 67% and it is significantly associated with negative clinical outcomes, including graft rejection, graft failure, and drug toxicity. The existing transplant-related questionnaires are a mix of questions on the quality of life, knowledge of kidney transplantations, medication adherence, lifestyle modifications, and self-care behaviours, but none is valid and reliable to measure KTRs' level of knowledge on immunosuppressants. The use of a non-validated questionnaire poses a risk of inaccurate judgement towards the constructs measured. It may also produce inconsistencies in intra- and inter-patient results. This study aims to develop a valid questionnaire by revisiting the current questionnaire on the knowledge of immunosuppressants used in renal MTAC. The objectives are to determine the relevant items for the revised questionnaire, to determine the content validity and to determine the face validity. This study will utilise both qualitative and quantitative methods in 3 phases which are the deductive method through literature review for item (question) generation (Phase 1), Delphi method with an expert panel who are pharmacists credentialed in renal pharmacy practise training to establish items' content validity (Phase 2) and the cognitive interview with KTR to establish items' face validity (Phase 3).

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Business Pitching Assessment: Strengthening Students' Entrepreneurship Skills in Community Pharmacy

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Abstract

Pharmacy Fiduciary is one of the courses offered to final semester undergraduate pharmacy students. Its main objective is to provide students with adequate entrepreneurship skills specifically in community pharmacy. To improvise the previous assessment method, a business pitch with the involvement of the community pharmacists is planned for this semester. The business pitching was conducted in the Faculty of Pharmacy with the involvement of community pharmacists as the external evaluators. Internal evaluators were lecturers from the faculty. Students were required to pitch their strategies to solve the issues faced by the pharmacy. Students were allowed to use any pitching aid tools to enhance their pitch. A PowerPoint presentation was not allowed to avoid the students reading the slides. With the requirements being set, students' creativity could be extended as much as possible. A short survey was distributed to investigate the students' feedback about the business pitching assessment. Most of them appreciate the insightful comments given by the community pharmacists. Some of them also showed an interest in community pharmacy after the business pitching session. They also learnt a lot from other groups. A few aspects were also suggested by the students for the improvement of the assessment. Some of them suggested the assessment be done in a group of four instead of in a pair. Some of them also mentioned that the grade allocated is too high which is 40% and they are afraid that their efforts might not be enough. The business pitching assessment in general has been useful in improving the entrepreneurship skills in community pharmacy among students. Apart from that, it also covers several beneficial aspects such as communication skills, confidence level, creativity, leadership and teamwork. A few improvements shall be considered based on the students' feedback before being implemented with the new cohort of students.

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Guess the Test! A Mystery of the Unknown Clues: A Board Game Conceptual Design

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Abstract

Statistics include unknown variables from data generated during research. The intricacy of study designs makes it more challenging to analyse the findings using statistics. The conclusion and interpretation of the results could be skewed if the wrong test was chosen. Due to the ambiguity of the variables and assumptions involved, selecting an appropriate statistical test can be tricky. However, there are various ways to improve understanding of the statistical test, and board games are one of them. Board games are a classic, analogue activity that has been proven to work well for stimulating game-based learning and nurturing soft skills. Therefore, we proposed the Guess the Test! board game to help individuals understand the key elements in selecting a suitable statistical test. This board game is based on clue-situation concepts, with mystery clues and game mechanics adapted from the popular Cluedo board game and tailored to case studies in biostatistics. In this game, players move around the board, guessing three elements: where, who, and what are involved in the case study. They must use deductive reasoning to narrow down the list of statistical tests, possible case locations, and possible types of variables. A player who correctly guesses-Where, Who, and What, will lead to the correct statistical test for the case, and hence, has a chance to win the game. This invention aims to teach deductive reasoning through clue-situation-based board games. Through this concept, it may foster critical thinking, involvement, and motivation to learn biostatistics. On top of this, the Guess the Test! concept game could be adapted to a variety of disciplines such as microbiology, biochemistry, pharmacology, engineering, and many others by incorporating real-life scenarios and clues that lead to decision-making. Furthermore, this board game can be used as a teaching tool to assist university students in comprehending the knowledge of statistical principles. This board game may have commercialisation potential by developing a prototype for evaluation to confirm the efficacy and accomplishment of learning objectives when using the board game. Since this proposed invention is at the initial phase, future game designs should emphasise enumerating more detailed clues and strategising the gameplay mechanics.

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Elucidating the Performance of High-Performance Polymer Reinforced in 3D Printed Denture Base

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Abstract

Three-dimensional (3D) printing has great potential in dentistry. Its capability of rapid prototyping allows it to simplify the process of manufacturing oral prostheses. Polymethyl methacrylate (PMMA) has been one of the most frequently used materials for denture base fabrication over the preceding decades due to its lightweight, low cost, and low odour. However, manipulation of this material in 3D printing is still in the early stages of development with a series of disadvantages such as poor mechanical properties, large shrinkage during polymerization, and low bacteria resistance. These limitations have hindered its profound clinical application. This study aims to increase the overall mechanical properties of the denture base material as well as to improve its antimicrobial properties by introducing the high-performance polymer (HPP), polyetherimide (PEI) into the composite matrix of the 3D-printed denture base. The reinforced 3D printing denture base resin will be formulated by introducing a different composition ratio of micro-filler PEI into the resin matrix. The mechanical properties were characterised by fracture, flexural, and impact strength. The biological properties will be characterised by the cytotoxicity effect on oral fibroblast (OF) and microbial adhesion of Candida albicans (CA). One-way analysis of variance was used to evaluate and analyse the data. The overall mechanical and biological properties have improved after incorporating the micro-filler PEI into the resin matrix. However, when excessive PEI was incorporated into the resin matrix, the mechanical properties declined when compared to the standard 3D printing resin. This is due to the agglomeration of PEI particles in the resin matrix and weakening the resin bond. Hence, with the appropriate amount of the micro-filler incorporation, it can enhance the overall resin matrix by improving the mechanical and biological properties. The overall mechanical and biological characteristics of denture base resin have been improved by incorporating PEI into the resin matrix.

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Bee Beauty – Bee Bread Clay Mask

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Abstract

Bee bread is produced by lactic acid fermentation of bee pollen in honeycomb. It is rich in polyphenols, vitamins, fatty acids, and minerals. Previous studies have shown that bee bread extract is rich in antioxidants and can protect skin cells from free radicals, while mineral-rich kaolin clay is known to absorb excess oil from the skin. Combining Bee Bread and Kaolin Clay, our specially formulated clay mask hydrates the skin, eliminates clogged pores and blackheads, and provides a visibly refined complexion. Bee Beauty Mask is a great addition to your skincare routine. It is easy to apply. This product is an attempt to diversify the products that can be made in this country by the honey industry. The effectiveness of Bee Beauty could encourage small beekeepers to meet the demand. In addition, cosmetic products derived from bee products such as propolis, pollen and honey have their own reputation in the market. Bee Beauty, therefore, has the potential to become another downstream product of the bee industry.

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LOVEME-Girls Safety Kit

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Abstract

Tragically, often concealed mental health effects are caused by sexual harassment. Sexual harassment can be triggered by many unsavoury actions, including those that are physical, verbal, gestural, visual, psychological, and online. Worse, young children and teenagers under the age of 18 may be sexually harassed. This can happen in elementary school, secondary school, or college. Even families and adults are unaware of the severity of the situation. Although preventative measures have been implemented, it may be more challenging to explain, educate, and approach young children and teenagers about sexual harassment. Therefore, as preventative measures, we are developing a safety kit for girls under the age of 18 named "LOVEME-Girls Safety Kit." This kit includes six items: a clear small bag, a security alarm, an emergency contact information card, pepper spray, a whistle, and a girl's self-defense infographic. Therefore, these girls will be more prepared, self-assured, and vigilant when outside. This kit might be made a requirement for all students, particularly girls, as well as for the community as a preventative measure against sexual harassment. This kit can be made into a useful safety package as it is affordable, lightweight, and safe to use by young girls as there are no sharp items in this kit. Although we are concentrating on sexual harassment situations, this kit can also be used in other emergencies such as floods and fires to attract help from surrounding people. In the future, we are planning to commercialise this kit due to high market demand and to collaborate with non-governmental organisations (NGOs) to distribute these kits, especially to the bottom 40% (B40) of the Malaysian household income communities in Malaysia.

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Telepharmacy Experiential Learning (TELE): Moulding the Future Pharmacists

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Abstract

The pandemic has significantly impacted pharmacists' interactions with patients. Telepharmacy and digital technologies are being utilised by pharmacists in a variety of settings to positively influence the health and wellbeing of patients. Tele-education should be incorporated into pharmacy training in order to prepare future pharmacists to provide services through telepharmacy. Telepharmacy experiential learning (TELE) is a pharmacy curriculum initiative designed to provide early exposure to technology-related health issues during the clinical practise clerkship. The introduction of the TELE training module for pharmacy students will enhance students' knowledge of drug therapy problems and their ability to convey patient care plans via technology. TELE was intended to equip future pharmacy graduates with the skills and learning opportunities to adopt telepharmacy practice. Several TELE approaches were applied, including the webinar with telepharmacy experts, medication use review via telepharmacy, case discussion and case presentation with pharmacy lecturers, and medication counselling via telepharmacy. Students had the opportunity to conduct medication use reviews with actual patients, thereby enhancing their communication skills within the context of telepharmacy. TELE will mould the profession of pharmacy by fostering the development of future pharmacists through the provision of students with an education and training that is adequately focused on technology. Tele-education should be strategically integrated into curriculums using a combination of didactic, simulation, and experiential instruction. As a future plan, this programme should be incorporated into the curriculum to continuously train future pharmacists in telepharmacy.

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Neuroendocrine Effects of *Vaccinium corymbosum* on Amyloid-Beta Peptide-Induced Amnesia in Mice – A Cognitive Boost

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Abstract

Alzheimer's Disease (AD) is a neurodegenerative disease that leads to the loss of memory due to the accumulation of neurotoxic amyloid beta (Aβ) peptide. In AD, it is prominent that stress induces the level of cortisol to be elevated, which causes the progressive imbalance of the hypothalamic-pituitary-adrenal (HPA) axis and affects cognition and emotion. This study was designed to determine the effect of ethanolic extracts of *Vaccinium corymbosum* and its fractions (VCF) on the involvement of mechanisms in neuroprotection and stress balance. The VCF were n-hexane, chloroform fraction, ethylacetate fraction, and aqueous residue. For pharmacological evaluation, male ICR mice (aged 4 weeks) were treated with a low dose (200 mg/kg) and a high dose (400 mg/kg) of VCF. On the 15th day of treatment, the mice were injected with Aβ (25-35) intracerebroventricularly (icv) to induce the neurotoxicity, and the VCF treatment was continued until the 21st day. A water maze test was conducted to determine the behavioural memory. Brain derived neurotrophic factor (BDNF) and acetylcholinesterase enzyme were estimated in brain homogenate and corticosterone was estimated in plasma. The preeminent neuroprotective effect was exhibited by the chloroform fraction and aqueous residue, which contain the active pharmacological compounds. This study indicates that *Vaccinium corymbosum* exhibits neuroprotection against Alzheimer's neurodegeneration and exerts neuroimmune-neuroendocrine regulation. The product of chloroform fraction has preeminent neuroprotective effects and exerts a cognitive boost.

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Drug Enquiry: Training of Evidence-based Practice for Pharmacy Undergraduates

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Abstract

Pharmacist as medication expert plays a fundamental responsibility to provide evidence-based information in response to drug related problem or enquiry from healthcare professionals and public. Drug information enquiries may be patient specific, general for educational purposes, or population based. As part of the virtual drug information centre (DIC) attachment, 183 third-year pharmacy students participated in the drug enquiry activity. In this simulation activity, students act as DIC pharmacists and provide an appropriate response to several drug information enquiries, including drug safety in pregnancy, renal dosage adjustment, and infant dosing. At the end of the DIC attachment, students are required to critically analyse their experience through reflective writing, and a survey was conducted to collect students' feedback. Out of 116 responses, 98% of the students agreed that the activity was in line with the DIC's objectives and increased their understanding of the function and role of DIC pharmacists in the hospital. Approximately 90% agreed that sufficient duration was allocated to perform the task, and the workload involved for the activity was appropriate. The majority of the students also agreed that phone calls and discussions via Google Meet are effective platforms for carrying out the activity. Recent utilisation of numerous therapy modes and a vast number of drug products in the healthcare setting has placed pharmacists in increasingly complex patient-care roles and necessitated a higher level of competence in meeting drug information needs. It is therefore critical for pharmacy education to incorporate training aiming to produce competent pharmacy graduates who are able to provide carefully evaluated, evidence-based recommendations to support specific medication-use practices. Hence, this will result in optimization of drug therapy and improvement in patient outcomes.

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ClinPharm-Demic: The Evolution of Clinical Pharmacy Clerkship Program

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Abstract

The Movement Control Order began nationally on March 18, 2020, with the closure of all government and private premises, including the higher institutions. Teaching and Learning (T&L) activities in the university were conducted as Open and Distance Learning (ODL) rather than the conventional Face-to-Face (F2F). However, as of today, there are more relaxed standard operating procedure (SOP) as we are transitioning from the pandemic COVID-19 to the endemic phase. For the past two years, Clinical Pharmacy Clerkship (CPC) was conducted virtually. Taking into consideration few feedback and comments from the previous students, we planned for a hybrid CPC this year. A few intensive discussion sessions were held between the department members and the paperwork was sent to the Hospital Universiti Teknologi MARA (HUiTM) for approval. Throughout the CPC, all students were given the opportunity to rotate for one week in HUiTM and another week in faculty. Due to the large number of students, we were unable to accommodate all 187 students for two weeks in the hospital. Hence, the decision was made to utilise our laboratories and lecture halls in the faculty. Some of the activities conducted during attachment in the HUiTM were case clerking in the ward, bedside medication counselling, patient interview and teaching sessions with the preceptors. A different activity was planned for students in Clinical Hub module; In-Patient Pharmacy simulation, SimMan patient simulation and roleplay session for devices counselling. Positive feedback was received from the final year students and the majority of them requested a longer duration of attachment in the hospital. A post-mortem session was conducted with the hospital preceptors on the last day of CPC. Both preceptors agreed that a longer rotation at HUiTM may allow students to develop clinical skills in a real-life setting.

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A Strategy for Efficient Product Development for VDDS (Vaginal Drug Delivery Systems) Exploring Nanotechnological Tools

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Abstract

Product development for localised infections like vaginal candidiasis has always been a challenging task for scientists, owing to peculiar physiological variation. If a product is developed considering the physicochemical and biological properties of drug and excipient(s), using modern scientific tools (like nanotechnology, in silico screenings etc) the desired product can be developed. First, in silico screening was carried out for the selection of drugs. For lipids (to be used in solid lipid nanoparticle i.e., SLN), interaction with bovine serum albumin was evaluated. To have maximum dug loading, a mixture of lipids was selected based on the data of maximum crystal lattice space (d value). Optimized SLN was characterised using particle size, DSC, XRD, TEM and entrapment efficiency. The SLN was further converted into a thermo-sensitive and muco-adhesive gel, which was characterised in vitro and in vivo. In silico screening suggested the best option to be Itraconazole. The composition of the selected lipid system was stearic acid and compritol 888 (1:1, w/w ratio). For the conversion of SLN into gels, Carbopol 934 and Pluronic F 127 were taken. The optimised gel exhibited a desired gelling temperature (35° C); viscosity (0.920 PaS) and appreciable in vitro drug release (62.2% in 20 h). The MTT assay of the optimised gel did not show cytotoxic potential and not any irritation potential (with appreciable bioadhesion) during in vivo studies. A significant decrease in CFUs was also observed in the rat infection model. The results show that if drug/excipient(s)-protein interaction and maximised drug loading in nano-carrier are obtained, the developed thermosensitive and mucoadhesive gel can be a suitable option for vaginal candidiasis.

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Development of Fulvic Acid as a Commercially Viable Excipient in Drug Products

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Abstract

Our group has been working to explore different properties of fulvic acid-FA (a humic substance) pertaining to pharmaceutical excipients (1,2) like bioavailability enhancer, mucoadhesion, buffering agents etc. In the given project, an attempt has been made to develop FA as pharmaceutical excipients according to the requirements of global regulatory agencies. The generally used source of FA in drug delivery is obtained from Shilajit which is not a commercially viable option. So, we have proposed switching to peat, and a lyophilized sample of a dietary supplement product (procured from New Zealand) was taken for the study. It was an aqueous solution of FA. Tests undertaken were physico-chemical evaluation, flow properties, SEM-EDX and TEM-EDX for elemental analysis, compatibility with other excipients, stability studies, non-clinical safety studies (acute toxicity in mice whereas sub-acute toxicity in rats) and some functionality tests. The results advocated its candidature to be used as a pharmaceutical excipient. But it needs to be purified further before being used as a pharmaceutical excipient. The presence of elements (although having nutritional values) affects the physico-chemical properties. A successful attempt has been made to generate the quality and safety data required for the acceptance of FA as a pharmaceutical excipient. But it requires more data to substantiate the claims.

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CTPharmKidsPlaydough

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Abstract

Playdough is the ideal entertaining and educational toy for kids of all ages that provides hours of entertainment while fostering creativity and fine motor skills. It also encourages the kids to explore the sensory properties of the playdough. However, the issue of the safety and health of play dough among children is polemic due to the harmful ingredients of play dough such as sodium borate, deodorised kerosene and sodium benzoate, including the toxic colouring agent. The bloom of *Clitoria ternatea* (Telang) has a vivid and deep-blue colourant and has been utilised as a natural colourant in food preparation, particularly in the local traditional culinary scene. Furthermore, *C. ternatea* has been reported to exhibit antimicrobial activity and is considered safe to be used among children. Therefore, we introduced CTPharmKidsPlaydough, a non-toxic product that is made of salt, flour, oil and *C.ternatea* with a longer shelf-life of up to six months. In contrast with store-bought play dough that typically dries up very quickly and cannot be used once it dries out and becomes hardened, the CTPharmKidsPlaydough kit can be revived by simply adding a little bit of tap water and kneading it. The kit is also designed to allow "do it yourself' attitudes among the children without involving their busy parents. This small kit is portable and easy to carry for both indoor and outdoor activities. By using natural and safe ingredients, the CTPharmKidsPlaydough kit can be produced massively and purchased at an affordable price of RM13 per kit. From a commercialization perspective, the CTPharmKidsPlaydough kit is ready to be marketed as a joyful learning tool among preschool and kindergarten children.

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endOSCEmic

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Abstract

Some virtual assessments require transformation to a face-to-face method as COVID-19 is moving from a pandemic to an endemic phase including the Objective Structured Clinical Examination (OSCE); a competency-based examination. The endOSCEmic was offered to the final year undergraduate pharmacy students (n=187) for two clinical pharmacy courses: i) PHC 550: Applied Therapeutics in Cardiovascular and Respiratory Disorder and ii) PHC 551: Applied Therapeutics in Infectious Disease and Neoplastic Disorders. Following appropriate restrictions (applying face masks, physical distancing) to prevent the spread of COVID-19, students were assessed on their cognitive, psychomotor and affective skills for a predetermined time. Students, examiners and support staff were requested to perform RTK test for COVID-19 prior to the OSCE session. Those who tested positive for COVID-19 were prevented from entering the exam labs and an online OSCE session was held for them. Students underwent a face-to-face four-station activity that tested their clinical competency within a 'set time' of 5-7 minutes in each station at the Faculty of Pharmacy. The competencies tested were the ability to i) perform history taking with a simulated patient (SP) (station 1) ii) identify, solve, and write down drug related problems (station 2), ii) perform drug and non-pharmacological counselling to the SP (station 3) and write down monitoring parameters when patient came for a follow up (station 4). SPs were recruited and acted as patients to assimilate the "real world" scenario of pharmacist-patient interaction. Despite having the COVID-19 restrictions, endOSCEmic was successfully executed via a face-to-face method which allowed evaluation of competency skills among the final year undergraduate pharmacy students. "OSCE does help the students to get insights into clinical situations that reflect what happens within healthcare work settings. Students can apply their clinical knowledge and skills as they work through each scenario encountered".

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STEMina: The Banana Soft Pith Fiber-Based Chocolate Cookies

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Abstract

The banana soft pith (BSP) has been found to be a potential functional food with high proximate content, soluble dietary fiber, swelling power, water holding capacity and solubility. In fact, banana soft pith possesses several medicinal values such as antihyperglycaemic, antiurolithic and hepatoprotective properties. Considering the lack of nutritional content in commercially available wide range of foods, BSP has been introduced as a new ingredient in bread and confectionary making. The addition of banana soft pith as one of the ingredients was also claimed to be able to alleviate the nutritional status of consumers. Moreover, Malaysia is relying heavily on imported products when it comes to fiber-rich foods like legumes, oats, apples and others. As of recently, issues related to food security, including price hikes and increased demand for food supply, have been a global issue. Therefore, fully utilising the local commodities can help in alleviating the economic burden for the country as well as the citizen. This project introduces a product, “STEMina”, which is a high-fiber chocolate cookie that uses banana soft pith as one of the ingredients. The BSP were selected and harvested from local farm. Then, the BSP were ground and applied to the making of cookies. Aside from the BSP, STEMina also contains wheat, eggs, butter, sugar and chocolate chips. Ultimately, the product promoted herein can ensure that consumers enjoy the sweet taste of cookies while experiencing a new flavour of BSP.

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Category II

Non-Academicians

BombBuzz

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Abstract

Tawas, widely known as alum, has a transparent salt crystal shape, is soluble in water, and reacts with acid. It is non-toxic and commonly used in cosmetic and culinary applications, as well as some medicinal and water purification processes. Tawas has the potential as a bleaching agent, and in this project, tawas was used in combination with other ingredients to produce a floor cleaning product named BombBuzz. The product was tested for contact angle and resulted in good wettability. Some commercial floor cleaning products have a chemical content that may harm consumers' health. BombBuzz was formulated as a fizzy floor cleaner that can help to eliminate tough stains without a lot of scrubbing and leaves a pleasant odour. It is also safe to use.

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Lure N Trap: Control Tools for Wild Rats

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Abstract

Wild rats are known as one of the deadliest pests in Malaysia. It plays a major role as a reservoir host and carrier of zoonotic diseases such as leptospirosis, salmonellosis, and tuberculosis. It can also cause property destruction, such as chewing electrical wires and causing fires. Despite the danger it carries, urbanisation has caused an uncontrolled elevation in the population of wild rats due to an increase in the human population, poor sanitization practices, and poor pest control programs. Lure N Trap is a great solution to control and eradicate wild rats. It comprises control tools that can be created from recycled items such as plastic bottles, pail and other home waste. These are very easy to do-it-yourself, safe, eco-friendly, effective and practical. In addition, the design of the tools is structured according to the behaviors of common wild rats, which will aid in luring and trapping them in the designated control tools. These new innovative control tools can prevent disease transmission, reduce the cost of treatment for infected humans and animals, prevent property destruction, and reduce the use of rodenticides and poisons. Hence, these control tools will reduce wild rats' population, which will diminish nuisance and disasters that will benefit society.

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BanaWrap

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Abstract

Plastic wrap offers a variety of benefits in a variety of shapes, such as sheets, panels, and film, which can all be flexible as the application requires. It is light in weight, strong, visually aesthetic, flexible in size and shape, and cheaper in price. However, use of too many plastics results in massively harmful effects. It takes a longer time to degrade, which is estimated to be about 500–1000 years to degrade and will become toxic after decomposition. Plastic pollution can unfavourably affect the land, waterways, and oceans. Thus, biodegradable plastic has become a promising solution to all of these problems. The objective of this study is to produce biodegradable plastic from banana peels as a substitute for conventional plastic and to prove that the starch in the banana peel could be used in the production of biodegradable plastic. The banana fruit peel was selected for this experiment because it is a waste material rich in starch. Glycerol is added as a plasticizer that increases its flexibility. To prevent the growth of bacteria and fungi, sodium meta bisulphite is used. The plastic was formed after several experiments. Although the plastic sample produced may not achieve the ideal characteristics of plastic, it is good in biodegradability as it can be composted in 6 days. The bioplastic prepared from banana peels can be used as packaging material like wrapping paper or carrying bags.

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iLISS: Laboratory Integrated Site System

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Abstract

Laboratory management is an important aspect related to the activity of planning, organizing, directing, coordinating, and controlling anything related to the running of a research laboratory. Nowadays, the management of research laboratories has become complex, which requires a systematic and efficient management system. The main problem was accessibility in terms of usage of laboratories, chemicals, equipment, and also personnel. Accordingly, the development of this centralised Laboratory Management System i.e. iLISS, is intended to facilitate laboratory management in Pharmacology-Toxicology, smoothly as well as improve existing conventional systems. iLISS covers the booking, application, registration, inventory data, virtual information and an online communication platform between the users and laboratory staff. The system is developed by using Google Site for programming and Google Drive for a central database. The development of this system uses the Rapid Application Development Model (RAD) which is used as a guideline in the development process so that it meets the characteristics that have been set. Based on the users' feedback, this system was found to meet the objective of the implementation with high capabilities to manage the laboratory systematically. Also, the users found this system user-friendly. With the development of iLISS, it can assist users, especially students and laboratory staff, in managing research laboratories more efficiently and effectively and can be implemented in the whole system of the Faculty of Pharmacy in the future. iLISS is a better and smoother laboratory management system.

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WristLax – the Amazing Ergonomic Wrist Band

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Abstract

The use of the computer mouse has been increasing over the years, and it has been identified as one of the occupational activities related to carpal tunnel syndrome (CTS). Carpal Tunnel Syndrome (CTS) is one of the most common neuropathies that occurs due to repetitive activity of the hand using non-neutral wrist posture, whether in flexion, extension, or ulnar and radial. Most people who spend long weekly hours at the keyboard may develop or aggravate carpal tunnel syndrome. Therefore, it is important to take care of our hands, especially the wrist, to prevent injuries like carpal tunnel syndrome. Supporting the forearm on the work surface during keyboard operation may increase comfort, decrease muscular load on the neck and shoulders, and decrease the time spent in ulnar deviation. Hence, we introduce WristLax, an amazing ergonomic wrist band that can help to protect and ease pain during work. The aim of this study was to examine the effect of WristLax use on wrist posture during forearm support.The WristLax is designed comfortably with a soft plastic band filled with aloe vera gel, crystal menthol and selected aromatherapy oils. The WristLax will be strapped comfortably on people's wrists and hands during typing work using a keyboard. The ideas of filling with aloe vera gel are to provide a comfortable space and an angle between the wrist and the workspace. The mixing with crystal menthol and aromatherapy oil provides a soothing, cool, and relaxing feeling for users. This WristLax conforms to the suggested ergonomics wrist angle for typing, which is close to 0° as the neutral posture while considering the maximum range to avoid excessive muscle fatigue. The idea of inventing WristLax is to promote safety in the workplace and help productivity at work. In conclusion, the WristLax is meant to make things feel more natural and safer, which means the wrist will feel less strained, there will be less pain with working, and health will improve.

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Da-Ilang X

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Abstract

Cleaning products such as dishwashing products, detergents, bleaches and other household cleaners play an essential role in our daily usage. As we know, many factors contribute to the cleanliness of the toilet bowl, such as the presence of bacteria, unpleasant odour, and appearance. The purpose of this project is to produce an effective toilet bowl cleaner that can remove nasty stains, unpleasant odors, and also function as antimicrobial. The product is named Da-Ilang X which will be put into the flush tank and will slowly release into the water. In the formulation, Tawas, or Potassium Aluminium Sulfate, and Sodium Lauryl Sulfate function as a cleaning agent while Benzalkonium Chloride functions as a bactericidal agent in this product. The product was compared with other commercialised toilet bowl cleaners. Thus, the result shows the zone of inhibition appeared, which means that the antimicrobial is proven. In conclusion, Da-ilang X successfully cleans and freshens bowls with every flush.

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Category III

Young Inventor: Undergraduate Students

GTNLARM21

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Abstract

The name of our project is GTNLARM21. Based on the name itself, it is a combination of Glyceryl Trinitrate (GTN) medication and alarm technology. GTN is a common medication that is used to relieve the pain from a heart attack. In this project, we used some technologies that consist of ESP32 TTGO Microcontroller, buzzer, resistor, jumper wires, breadboard, LED, HC-05 Bluetooth module, and LILYGO®TTGO T-Watch-2020 ESP32. These technologies will be set up on GTN bottles and will deliver a beep sound when they detect a spike in the heartbeat (more than 100 beats per minute), which indicates a heart attack is happening. This product, which is a combination of the latest technologies, has the ability to reduce the mortality and morbidity rates resulting from heart disease. This product targets people who are on GTN medication, especially elderly or disabled patients with a history of heart attacks. Patients with heart attacks must always bring their GTN medication no matter where they are going because heart attacks can happen at anytime and anywhere. Failing to consume the GTN in time and correctly will cause a patient to become unconscious and can lead to serious complications, including death. The main reason why we came up with this project is to provide early warning of a heart attack, as the beeping alarm will make the user or person around the user more alert and immediately help the user to take the medication. This action can decrease the chances of the user getting a cardiac arrest or sudden death. Therefore, the GTNLARM21 is one of the solutions that is expected to prevent this incident from happening. The cost of our project is in the range of RM350.

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Natural Antibacterial to Protect Children's Skin by *Carica papaya L.* Bubble Bath Bomb

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Abstract

Soap is a product that is used to remove dirt, sweat, dead skin cells, smooth, and moisturise the skin. In general, some are in solid form and some are in liquid form. The purpose of this research is to make an innovative soap preparation in the form of a bubble bath bomb made of natural ingredients with antibacterial properties that are suitable for children's skin. One of the natural ingredients that has an antibacterial function is *Carica papaya*. The antibacterials contained in papaya leaves are karpain alkaloids. The benefits of this bubble bath bomb preparation are to clean and moisturise children's skin while providing a bubble bath sensation that children love. Extraction was carried out by the maceration method using 80% ethanol. From the results of the study, it was found that the bath bomb soap was solid, colorful, and scented well. In addition, the foam stability was obtained for 5 minutes, and the effervescent time was recorded to be about 2.5 minutes to completely dissolve in water with a pH is in accordance with the child's skin. The degree of acidity corresponds to the acidity of the skin of children over 7 years old. The conclusion of this study was that the antibacterial bubble bath bomb preparation of papaya leaf extract (*Carica papaya L.*) passed the evaluation of cosmetic preparations for the skin of children over 7 years old.

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Category IV

Junior Inventor: Primary & Secondary School Students

Bluebellvine Beauty Skincare: A Formulation of An Anti-Acne Cream

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Abstract

Many skincare products on the market are synthetic and made from harmful chemicals such as mercury, hydroquinone, and parabens. Not only is it widely used due to the low cost, many consumers also fall for the appealing advertising. They are unaware of the harmful ingredients that can cause various effects on the skin, such as skin irritation, eczema, and cancer. Research showed that the skin absorbs up to 60% of the chemicals in a product. Even when using small amounts of the product, the chemicals can have a tremendous health and hormonal impact. The objective of this innovation is to produce skincare products based on natural resources that are organic and safer for consumers. The Bluebellvine plant, or its scientific name, *Clitoria ternatea* is a native plant in Asian countries. It is found in many tropical and sub-tropical countries, such as China, India, and South America. In Malaysia, bluebellvine flowers are used as a dye in the making of *Nasi Kerabu*. Traditional Indian medicine uses it as a brain tonic to promote intelligence. The extract of the flower was also reported to be applied to cure skin diseases and insect bites. Bluebellvine Beauty Skincare is an anti-acne cream formulation that functions to help individuals who have skin problems such as dry skin, acne, and oily skin. The main ingredient of this formulation is made from Bluebellvine flowers extract. These ingredients are water-based to treat skin problems and improve skin health. The results of the lab test found that Bluebellvine Beauty Skincare is slightly acidic, which has a pH 5.7, and it is suitable and safe for skin. Bluebellvine Beauty Skincare has high commercial value in the market due to its natural and organic ingredients. It is affordable and safe for consumers.

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Saving Forest Bio-Diversity

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Abstract

Forest biological diversity is a broad term that refers to all life forms found within forested areas and the ecological roles they perform. Forests are critical habitats for bio-diversity, and they are also essential for the provision of a wide range of ecosystem services that are important to human well-being. There is increasing evidence that biodiversity contributes to forest ecosystem functioning and the provision of ecosystem services. As time goes by, the number of trees is decreasing because humans are cutting off the trees to create a concrete jungle in the name of development. Trees are very important to us because they give us oxygen to breathe, give animals habitats, and prevent soil erosion, landslides, floods, and global warming from occurring. Based on statistics, pencil production year 2020 shows that 82,000 trees have been cut to produce 14 billion pencils. We are sharing a small idea about recycling pencil shavings, which if adopted in all schools would have a great impact. In just five steps, you can collect pencil shavings and turn them into pulp. With the pulp, we can produce paper 'almost' and also chipboard to make a chair, cabinets, bricks, fire starters, etc. In conclusion, trees are playing a very important role in forest biodiversity. Hence, we should take the necessary steps to save trees. For example, we should use less paper, buy only sustainable wood products, and do not burn firewood excessively. Use recycled paper and cardboard, raise awareness and plant more trees. By following the above steps, we are able to protect forest biodiversity. Last but not least, we are proposing this project to our school to introduce a pencil shaving collection. By doing so, school students are able to appreciate the importance of trees and practise recycling and reusing pencil waste.

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