## Knowledge and Awareness of Radiation Exposure and Risks among Patients

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The aim of the study was to determine and assess the knowledge and awareness of patients on radiation exposure and risks when in medical imaging procedures around the selected local institutions within Pampanga. A descriptive and cross-sectional design was used in the study. A consecutive sampling design under non-probability sampling technique was used as a method of selecting the participants. A total of 64 questionnaires were returned (27 males and 37 females.) Of these, 48 were college graduates and 16 reached secondary school. Most of the respondents underwent general x-ray examinations with a frequency of 32, Ultrasound (19), and MRI (11). Most of the respondents were not knowledgeable that Ultrasound and MRI do not involve the use of radiation. Moreover, 60, 56, 40, and 41 of the respondents were knowledgeable of the radiation-laden nature of X-rays, CT, Barium Swallow, and Barium Enema, respectively. Furthermore, 60 of the respondents were aware that they must be told of the need to have an x-ray and the associated radiation risks. Lastly, most patients believe that prior to undergoing medical imaging, it is necessary for them to be informed about the procedure, the dose they receive, and its associated risks.

*Keywords: knowledge and awareness, patients, radiation exposure, associated risks, medical imaging*



## Heroes in Healthcare: Lived Experiences of CDRRMC Nurses in the Face of Calamities

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Blessed with beautiful natural landscapes, the tropical country of the Philippines seem like a paradise and the perfect vacation destination to foreign visitors. Little do they know that the country often suffers from an inexhaustible number of deadly typhoons, earthquakes, volcano eruptions, and other natural disasters. This research study entitled “Heroes in Healthcare: CDRRMC Nurses in the Face of Calamities” addresses the unique experiences of disaster nurses working in Cabanatuan City, Nueva Ecija. This research study aims to describe and explore the lived experiences of CDRRMC nurses. Based on the data gathered, the following themes emerged: 1) Altruism, 2) Role and Responsibility, 3) Psychological Burden, 4) Encountered Challenges, and 5) Overcoming Adversity through Competency. The researchers recommend to the nursing education and practice to emphasize the basic principles of disaster management into nursing courses. Researches have indicated nurses are often unprepared to respond to disasters because of lack of disaster nursing education and training. Health systems and healthcare delivery in disaster situations are only successful when nurses have the fundamental competencies or abilities to rapidly and effectively respond.

*Keywords: disaster nurses, calamities, heroes, emergency nursing, typhoons, flooding, disaster preparedness, disaster management, disaster response*

## Relationship and Demographic Differences of Health Literacy and Health-Promoting Behaviors among Teen Pregnant Mothers of Northville 16, Brgy. Atlu Bola, Mabalacat City Pampanga

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Certain literatures cited that health literacy (Ruifrok et al., 2014; Di Fabio et al., 2015; Haakstad et al., 2007; Chasan-Taber et al., 2007; Evenson et al., 2009; Haakstad et al., 2009; Loprinzi et al., 2013) and health-promoting behaviors (Walker & Twonsend, 1999; Viboonwatthanakitt, Pancharean & Tipalonkot, 2007; Borudulin et al., 2008; Ferraro et al., 2012) can be significant to pregnant mothers. But, there was no study had been conducted if these two factors can be significant to each other as prognosticating the maternal-child health. The study aimed to determine the relationship and demographic differences regarding health literacy and health-promoting behaviors among teen pregnant mothers. The design are descriptive-comparative and descriptive-correlational methods. Purposive sampling and snowball sampling technique was employed and it yielded a total of 47 participants who met the following criteria: (1) A teenage pregnant mother, (2) resides at Northville 16, Brgy. Atlu Bola, Mabalacat City, Pampanga, (3) regardless of trimester of pregnancy, (4) regardless of her gravida, (5) 13-19 years of age, and (6) willing to participate. It utilized an adapted tool namely *Adolescent Health Promotion Scale* and *Comprehensive Short-form Health Literacy Survey* wherein they secured permission through email before they gathered the data. This had undergone back translations and pilot testing generated an internal consistency of > 0.80. Ethical approval was obtained from Our Lady of Fatima University-Ethics Review Committee. Data were analyzed using SPSS v. 21 with the ff: Frequency, percentage, descriptive mean, Kruskal-Wallis Test, and Spearman rho. Results shows that there is a significant difference between educational attainment and the health-promoting behavior of teenage pregnant mothers ($\chi^2(2) = 11.541$, $p = .042$). There is also a significant difference between age and the health-promoting behavior of teenage pregnant mothers ($\chi^2(2) = 3.274$, $p = .195$). Lastly, there was a strong, negative correlation between health literacy and health-promoting behavior of teenage pregnant mother, which is considered statistically non-significant ($r_s(47) = -.127$, $p = .393$). The age and educational attainment of teenage pregnant mothers must be the focus of empowerment and health teachings with regards to their health advocacy since it was found to have significance in the result.

*Keywords: teenage pregnant mothers, health literacy, health-promoting behavior, maternal nursing*

## Lived Experiences of SPCF Nursing Students towards Caring of Geriatric Clients: A Descriptive-Phenomenological Study

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Student engagement with gerontological content in the classroom or clinical setting results in improving nursing students attitudes toward persons who are aged. (Hovey, Dyck, Reese & Kim, 2009-2015). The study is aimed to explore, analyze and reflects on the lived experiences of SPCF nursing students towards caring of geriatric clients. Descriptive-phenomenological method was employed and it yielded five (5) participants who met the following criteria: 1) a Bachelor of Science in Nursing student of SPCF; 2) 3rd year or 4th year level; 3) who experienced caring of old clients (60 years old and above), and 4) willing to share and articulate their experiences. Culling of significant statements was achieved using an open-ended semi-structured interview guide and for its data analysis; it employed the Collaizzi's method of phenomenological inquiry. Ethical approval was obtained from Our Lady of Fatima University-Ethics review Committee. This uncovered four (4) themes and ten (10) subthemes namely: A) Building the wall of boldness and guts with three subthemes namely: a1) Beating the fear of unknown, a2) Building the trust as universal way of establishing care, and a3) Communication matters everything; B) Building the revolving doors of clinical application with two subthemes namely: b1) Bridging the gaps between theory and practice and b2) Uttering all the salient points of geriatric clients; C) Building the windows of verboseness with three subthemes namely: c1) Taking care as initial advocacy, c2) Initiating commitment in taking care of geriatrics clients, and c3) Addressing all the difficulties; and D) Building the fence of positivity with two subthemes namely: d1) Opposite of ambivalence: family-oriented and practice matters and d2) Building of holistic relationship. Somehow, the student nurses exhibit some curiousness as well as anxieties as they started to face the realm of this profession. However, the notions regarding difficulties in taking care of older clients perhaps has been surpasses as narrated by the participants which for instance, it make them feel good to take care of them. In addition, the participants revealed that they execute their care for these older clients because it is not merely the good grades that they need to pursue with or having the recognition from their respective instructors, rather, it is more on the calling and responsibility since they chose to enter this noble and caring profession, which is Nursing.

*Keywords: geriatric clients, nursing students, descriptive-phenomenological study, Collaizi's phenomenological steps*

## Phytosynthesis of Silver Nanoparticles using *Cymbopogon citratus* Decoction Extract and its Larvicidal Activity against *Aedes aegypti* and *Culex quinquefasciatus*

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Mosquitos as a biological vector spread severe and often fatal diseases, leading to millions of deaths and disfigurements yearly. Management of these vectors often involves harsh chemicals that employ a destructive approach, in addition to the difficulty of application to the mature stage of the organism. As a result, controlling the larval stage situated in stationary breeding sites is more efficient. Meanwhile, nanoparticle technology has steadily improved over the years but the chemical synthesis of massive quantities of these nanoparticles for commercial use is known to be costly, inefficient, and harmful. This study used the decoction extract of *Cymbopogon citratus* as a capping and reducing agents. In vitro bioassay results indicate that while the pure decoction extract exhibited minimal larvicidal activity, the phytosynthesized silver nanoparticles showed remarkable activity against *C.quinquefasciatus* and *A.aegypti*. Statistical analyses show that concentration provides a significant difference for *A.aegypti* and that mortality is influenced greatly by the interaction of exposure time and concentration. These results show that *C.citratus* can be used as a reducing agent in the synthesis of silver nanoparticles for larvicidal use against *A.aegypti* and *C.quinquefasciatus* as an ecofriendly and cost-effective approach.

*Keywords: A. aegypti, C.quinquefasciatus, Cymbopogon Citratus, Decoction Extract, Nanoparticles*

## Heavy Metal Testing of Overused Street Food Oils Along Don Honorio Ventura Technological State University, Bacolor, Pampanga

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The concentration of heavy metals in overused oil is an important factor for the assessment of oil quality with regards to its safeness, keeping properties, storage, and their influence on human nutrition and health. In this work, the researchers identified street food stalls selling fishball, kikiam, and squid ball using overused oil. A standard protocol was used in the process of quantifying overused oil. It shows that overused oil has a brown color, fishy and burnt odor, fishy and bitter taste. The content of lead (Pb) and cadmium (Cd) in overused oil collected in four selected food stalls along DHVTSU were determined using Shimadzu Analytical Technique and Flame Atomic Absorption Spectrometry (FAAS). The results of the study show that in all overused oil samples, lead and cadmium were not detected.

*Keywords: Cadmium, Heavy Metal Testing, Lead, Overused Oil*

## Microbial Screening of Computer Keyboards Used in Computer Shops along Don Honorio Ventura Technological State University

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Microorganism have been known to manifest and survive on different surfaces. Multi user keyboards are among these surfaces that could serve as a reservoir of microorganism, many of which have the potential to be pathogenic. The aim of the study is to conduct microbial screening of computer keyboards in selected computer shops along Don Honorio Ventura Technological State University. A total of 12 computer keyboards were sampled from 3 computer shops near the campus. Microorganisms such as Staphylococcus aureus and Escherichia coli were isolated. From the data obtained, CFU of S. aureus ranges from 19 CFU/cm2 to 37 CFU/cm2. This indicated contamination of keyboards. Although there was no detected presence of E. coli on the keyboards, it doesn't necessarily mean that the computer equipment are free from pathogenic microorganisms. Regular cleaning and disinfection is recommended to reduce bacterial growth. Hand washing would also be effective to avoid cross contamination. These findings suggest contamination of computer keyboards that could cause bacterial transmission and infections.

*Keywords: E.Coli, Microbial Screening, Pathogenic*

## Triple-based Method Air Purifier Utilizing Solar Power

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Most public and private Comfort Rooms in Philippine universities are not equipped with an efficient air purifying system. The result is a continuous build-up in the level of different gas pollutants like $SO^2$, NO, and $CO^2$, and suffocating odors in such vicinity which have been reported in most cases a level exceeding the threshold value. As an aid to this problem, the researchers have developed a simple device to effectively reduce those airborne impurities by 71.25% within 5.5 hours. The findings were conducted in a male comfort room with a dimension of 26 by 7.5 by 7 cubic feet containing a single door and a narrow window. High-Efficiency Particulate and Gas absorbers with the aid of Ultraviolet Germicidal Irradiation for sterilization and an Ionizer to charge pollutants were simultaneously implemented. The combined efforts of the three techniques allows an extensive purification to include viruses, bacteria, Airborne fungi, pollen, sub-micron particles such as carbon monoxide and nitrogen oxides, chemicals and other noxious gases whose sizes extends from about 0.01um to 10um. The concentration of air pollution was monitored by MQ135, the air quality control sensor, which has a recorded mean initial value of 477ppm of air pollutants, gradually reduced to 137.14ppm in a 5.5-h continuous operation. Such overall lead of a significant decrease in airborne contaminants has diluted the amount of odor within the environment of the study as observed by the respondents. The ozone emission of the ionizer, unmeasured, is theoretically lower than industrial safety standard.

# Arduino based Neonatal Warmer with Built-in Vital Sign Monitoring System

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Newborns, either full term or preterm requires thermal support after birth. A practical guide for thermal protection of the newborn implemented by the World Health Organization stated that, it was back in 1900s when it was realized that adequate environmental warmth is essential in the care of small infants because they could not maintain their own body temperature. A preterm newborn can maintain a temperature that is as low as 0 degree Celsius while full term infants can maintain 20 to 23 degrees Celsius. Since then, hypothermia was recognized as a significant contributor of neonatal morbidity and mortality. Since a newborn infant has a much lesser capability to regulate its own body temperature than of an adult, it also losses heat more easily. The smaller and more premature the baby, the greater the risk of hypothermia. A mild hypothermia where the body temperature measures around 36.0 degrees Celsius to 36.4 degrees Celsius, skin-to-skin contact with the mother should be enough to rewarm the baby. However, in cases like moderate to hypothermia where the temperature drops from the range of 32-35.9 degrees Celsius and severe hypothermia where the body temperature measures less than 32 degrees Celsius, using a radiant warmer is one of the immediate action in rewarming the baby. But not all newborns are given access to a radiant warmer especially those who are born in local birthing clinics and health centers located on remote areas where a radiant warmer is not available due to its expensive price. On the other hand, monitoring the vital signs of the patient is essential when it comes to neonatal care. Body temperature, pulse rate, respiration rate and blood pressure are the most commonly monitored vital signs, though blood pressure is not considered a vital sign, but is often measured along with the vital signs. (Hopkins, 2018) On an interview conducted by the researchers to a NICU nurse working in a private hospital, a minimum of P5, 500 and a maximum of P7,500 will be charged per day for a pre-mature or unwell baby. These includes the rental of incubator or warmer itself, vital monitoring equipment such as pulse oximeter, ECG and cardiac monitor. The researchers have conducted a site visit in a local birthing clinic located at Bebe Anac Masantol, Pampanga where the conventional way of rewarming a newborn is still used such as using incandescent bulb directly placed on top of a newborn and using heated bottles placed beside the baby which is very dangerous. This way of warming the baby can easily cause burns as the blood circulation in the cold skin of the baby is poor. Therefore, they should never be put beside the baby. After performing researches, interviews and site visits, the researchers observed several problems, first is that neonatal warmers used in hospitals doesn't have a vital monitoring system that requires the patient to rent additional equipment which adds to the billing cost. Also, traditional way of producing heat on newborns uses incandescent lamp and heated water bottle that harms the baby's skin and may lead to hyperthermia. And lastly, commonly used warmer lacks indication on the amount of heat released to be absorbed by the patient's body to meet the required body temperature. This study is for the benefit of the Local Government Unit Health Centers and Birthing Clinics in remote areas who cannot afford the expensive Radiant Warmers and Vital Monitoring Devices offered in the market that are used by the Private Hospitals. The system will be a huge help especially for the new born babies who needs thermal support upon coming out from their mother's womb. The objectives of the study is to develop a system that provides thermal support that a neonate needs in birthing clinics on remote areas where conventional way of warming is still used. Along with this, the researchers aims to develop a monitoring system for vital signs of the patient such as pulse rate, body temperature and cardiac activity. Also, to develop an alternative warming system that produces appropriate amount of heat and to monitor the Neonatal Warmer's ambient temperature and humidity are considered. Several methods we're used in developing this study, comparative analysis such as determining the advantages and disadvantages of each component and sensor that will be used in the system is considered. For the data gathering and testing, the researchers used conventional test tools such as digital thermometer and stethoscope in getting the body temperature and pulse rate respectively and compared the values using the system's vital sign monitoring. After the data gathering the accumulated values we're treated statistically using T-test, graph comparison and accuracy test. To increase the reliability of the system, another testing was conducted with the supervision of a Biomedical Engineer while using the test tools that are currently used in the medical institution and compared the acquired values using the developed system. Evaluation of professionals such as nurses and biomedical engineers was also conducted to test the overall stand of the developed prototype and to seek additional recommendations for the improvement of the system. After several testing, the researchers have gathered an accuracy percentage of 96.56782838 in comparing the pulse rate measured using the conventional way and the system's vital monitoring and an accuracy percentage of 96.27789567 in comparing it with the test tool used in hospitals which is a pulse oximeter. In terms of body temperature, the system acquired an accuracy percentage of 98.89685683 in comparing it to the conventional way and an accuracy percentage of 97.79965018 using the test tool used in hospitals which is an infrared thermometer. Though the acquired values in accuracy test we're high, the system still requires improvement and further development in terms of sensor calibration to reach the standard accuracy accepted in medical field. Furthermore, adding another vital to be monitored such as blood pressure and oxygen saturation of the blood will be a great improvement of the system. A servo mode that will control and regulate the temperature of the warmer automatically is also recommended to further improve the regulation of heat inside the neonatal warmer. Considering an adjustable bed in terms of elevation and tilting is also recommended for the improvement of the structural design. Since the study is recommended for further development, it is therefore not ready for use on actual patients but is ready for demonstration purposes.

*Keywords: radiant warmer, vitals, pulse rate, body temperature, neonate, heat, monitoring*

# A.C.E.S (Arduino-Controlled Electronic Stick): A Blind Person's Obstacle Reminder

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Vision is the most important part of human physiology as 83% of the human information is got from the environment via sight. Visual impairment – blindness – is another health issue that has been given limited attention in spite its impact on afflicted Filipinos. Already, the Department of Health warned that more than 2 million people in the country suffer from low vision in both eyes, where even with glasses, contact lenses, medication or surgery, a person is unable to see clearly. At the same time, DOH reported that atleast 300,000 Filipimos are bilaterally blind or are totally unable to see. (Mims. (n.d.). Number of vision-impaired Filipinos on the rise - DOH). Visually impaired people find difficulties detecting obstacles in front of them, during walking in the street, which makes it dangerous. The main problem is the adversity for people with visual disabilities to walk outdoors and to adapt to their surroundings. The A.C.E.S. (Arduino-Controlled Electronic Stick): A Blind Person's Obstacle Reminder, comes as a proposed solution to enable them to identify the obstacles near them. In this paper the researchers propose a solution, represented in a smart cane. The aim of the overall system is to provide a navigation aid for blind which gives a sense of artificial vision by providing information about the environmental scenario of objects in front of them. The goal of the study is to develop an electronic cane that can help visually impaired people to safely-move among obstacles and other hurdles in front of them during their day-to-day activities and to let them navigate themselves without needing much help from others. The solution developed is a user-friendly navigational aid for them. The device is designed with an intention to sort out common issues faced by the blind people while using traditional sticks. This system is capable to people who are visually impaired especially elders who are mostly prone to visual problems. It is designed to substitute, as an innovated ones, the traditional canes which are already familiar to people. It is can also be used by the blind patients in the hospitals or clinics for their medical assistance. The use of traditional cane takes time and effort and does not help the users with visual impairments to find obstacles with distances greater than 1 meter. If detecting obstacles in a conventional way needs more time and effort, then using A.C.E.S. (Arduino-Controlled Electronic Stick): A Blind Person‟s Obstacle Reminder will lessen the time it takes to detect obstacles ahead. ACES is a smart cane with ultrasonic sensor to detect other obstacles in front of the user, within a range of two meters and two infrared sensors to detect stairs and somehow can also detect obstacles. Moreover, another sensor (4 pairs of wires) is placed at the bottom of the stick for the sake of avoiding puddles. When a water puddle is detected, the vibration motor activates and when an obstacle is detected, speech warning messages which is stored in a micro SD card which is inserted to the mp3 player module will play through headphones. This proposed system uses the Arduino Nano having ATMega328p microcontroller embedded system, vibration motor and mp3 player module. The cane is capable of detecting all obstacles in the range two meters and gives a suitable respect message. In doing the data and results, the proponents came up with an idea to use time response as a parameter to measure the information needed. The researchers measured the time covered in detecting obstacles when distances are equals to 2 meters and 1 meter. It can be seen in the data that the time covered in detecting obstacles using the system is short. In the comparative analysis the researchers conducted, it is noticed that using the system will require shorter time than the traditional cane. For the validation procedure of the project, the researchers use the V-model. The V-model is a software development life cycle model where execution of processes happens in a sequential manner in a V-shape. It is also known as Verification and Validation model. It is an extension of the waterfall model and is based on the association of a testing phase for each corresponding development stage. This means that for every single phase in the development cycle, there is a directly associated testing phase. This is a highly-disciplined model and the next phase starts only after completion of the previous phase. Under the V-Model, the corresponding testing phase of the development phase is planned in parallel. So, there are Verification phases on one side of the „V‟ and Validation phases on the other side. The Coding Phase joins the two sides of the V-Model. Quantitative data sources like questionnaires, surveys and interview are used to identify the common obstacles encountered by the blind. Interviews are conducted for further identification of the needs and its respective solutions that are possibly provided by the system. The researchers also conducted online researches in getting ideas from the searched articles, existing related literatures and studies to prove that the project is feasible enough to make. Components specifications and datasheets as well as newest technology trends and other factors are obtained in this method. After all necessary data have been gathered, the next step the researchers did is data processing. It is a series of actions or steps performed on data to verify, organize, transform, integrate and extract data in an appropriate output form for subsequent use. In processing the data, the researchers categorized the data based on objectives or purpose of the study then coded numerically, tabulated and analyzed using Data Analysis in Microsoft Excel. Statistical treatment of data is essential in order to make use of the data in the right form. Raw data collection is only one aspect of any experiment; the organization of data is equally important so that appropriate conclusions can be drawn. In statistical treatment, the researchers conducted T-test and have the correlation, standard deviation and sample standard errors calculated. With all the testing done, the researchers came up to the conclusion that the smart cane is fast response, low power consumption, strong enough to support the weight of the user and has ability to adjust. Mobility aids for the blind people especially ultrasonic and infrared impediment detectors do not guarantee precise and normal movements for the blind and to move like people with normal eyesight but it will help to make their life easier. Further aspects of this system can be improved via wireless connectivity between the system components, thus, increasing the range of the ultrasonic sensor and implementing a technology for determining the speed of approaching obstacle. While developing such an empowering solution, visually impaired and blind people in all developing countries were on top of our priorities. The group commends further development of the study and improve the system by adding special feature like sensing a slippery and slick area.

## Arduino-Based Walking Cane using Two-Way Power Source for Visually-Impaired People

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Electronic Travel Aide is a breakthrough technology that can help visually impaired people to navigate indoor and outdoor independently. According to World Health Organization (WHO), an estimated number of people Worldwide who are living with some form of vision impairment is approximately 1.3 billion and 80% of all vision impairment are considered avoidable. In order to reduce the problems of the visually impaired people in dealing obstacles in their footpath, an electronic walking stick is proposed. The main aim of the system is to develop an electronic aiding stick that can detect obstacles along the pathway of visually impaired people. This system assists the user to walk without tripping with the obstacles in their path. In this proposed system ultrasonic sensor, vibration motor, buzzer, microcontroller and two-way solar power bank are used. Ultrasonic sensor will detect the obstacles up to a distance of 100cm. The user will be then notified through a buzzer and a vibration motor. The solution developed can help visually impaired people to live their life less dependent on the assistance of others.



## Raspberry Pi Based Weighing Scale with Emergency Drug Dosage Calculator and Dispenser for Toddler

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The science and practice of the diagnosis, prevention of disease and treatment is the medicine. It engirdles a variety of health care practices to maintain and restore health. Medication errors are among the most common health threatening mistakes that affect patients' care leading to different types of health conditions that may even lead to death. Administering drug to patients especially toddlers in a matter of life and death, physicians especially those inexperience may feel pressure that can lead to medical malpractices such as dosage misestimation and inaccurately prescribing or when administering emergency drugs to toddlers.