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THE EVOLVING ROLE OF DIGITAL TECHNOLOGIES FOR PATIENT EDUCATION IN NON-COMMUNICABLE DISORDERS

Dr. Praneetha Jain*

Health systems are profoundly impacted by digital health. Using technologies may improve the accessibility of online information about illnesses, treatments, side effects, and recent advancements in scientific research. Digital health has a broad scope and includes wearable devices, mobile health, telehealth, health information technology, and telemedicine. The reliability, safety, testing, and ethical aspects of digital health technology are only a few of the concerns yet to be resolved.

Patient education delivered by a health care provider increases patients' understanding and adherence to medical instructions, which helps to improve patient health. An evolving body of evidence supports the use of digital health technology for enhancing patient education and implementing skills and behaviours integral to lifestyle medicine. Today, patient education can be provided in traditional formats (such as articles and written messages) and a wide range of multimedia (such as interactive games and video), some of which may be more effective for particular topics and learning styles.^{1,2}

- **Text messaging:**

Messages can be sent at timed intervals, including frequent reminders, bursts throughout the day, and critical decision-making moments. Text messages provide advice, motivational reminders, and support to change lifestyle behaviours. Compared with usual care, this intervention resulted in a modest improvement in the outcome.³

- **Custom-developed patient education applications:**

Applications educate patients by providing insight into their behaviours and opportunities to practice new skills. Applications are also a place for them to store their health information securely and review the claims history. The patient thus becomes more informed and is in a better position to make clinical decisions regarding his health. The use of digital interventions also revealed significant reductions in barriers and increases in knowledge and attitudes about preconception care.⁴

- **Wearables devices:**

The wearable devices provide heart rate tracking, physical activity monitoring, sleep schedule, track stress level etc. Mattress covers connected to the internet can monitor temperature, breathing, and heart rate to track sleep quality; in the future, these smart devices might work together to monitor patients' lifestyles and offer individualized instruction and feedback to promote healthier behaviours.⁵

- **Patient portals for education via telemedicine:**

Using technologies to diagnose, monitor, and treat patients remotely is known as telemedicine. Whether the information is patient-specific, hospital-related or about post-care through the recovery continuum,

patients and their care givers can remotely access them through the patient telehealth portals. Some examples of telehealth interventions showing benefits include mortality and cost savings, including home telemonitoring programs. Additionally, telehealth programs have been shown to improve medication adherence.⁶

- **Digital therapeutics:**

Digital therapeutics are evidence-based digital health tools, often Food and Drug Administration-approved. Easy access to longitudinal data patterns and insight into the effectiveness of specific lifestyle medicine program variations provide opportunities to provide education. Most digital therapeutics provide some form of patient education, especially for chronic disorders.

- **Virtual and augmented reality :**

Virtual reality is an emerging technique in patient education. This technology allows patients to implement new behaviours and skills through experiential learning A 2017 systematic review and meta-analysis of 28 studies showed that virtual reality games positively affected balance and fear of falling in community-dwelling older adults.⁷

- **Machine learning :**

Machine learning is the study of tools and methods for identifying patterns in data. Machine learning can either increase our understanding of the current world (e.g., identify risk factors for infection) or make predictions (e.g., predict who will become infected). The branch of artificial intelligence that likely holds the most short-term relevance for lifestyle medicine is that of machine learning (ML).

- **Social media :**

For people with restricted mobility, online social support is hugely valuable since it lowers the barriers to transit. Positive research on quitting smoking and losing weight has been conducted.⁸

- **Visualization through 3D printing technology:**

Visualization of the ailments via 3D Printing has the potential to let the patients have a better overview of their conditions leading them to make better-informed decisions concerning their treatment plans.

Research on and evaluation of digital health outcomes and impact are essential to support its safe implementation, to promote medication adherence and optimum clinical outcomes.

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MONKEYPOX – A GROWING EPIDEMIC

Zainabath Mahnoora^a, Shreyas K^b

Monkeypox is derived from the genus Orthopoxvirus from the family Poxividae. This genus has two kinds of viruses: smallpox and monkeypox virus. Monkeypox is a zoonotic disease (spread from animal to human or vice versa) and was initially diagnosed with pox-like symptoms on colonies of monkeys kept for research in 1958, hence the name monkeypox. At the time of the elimination of smallpox in 1970, monkeypox in humans was first identified in the Democratic Republic of Congo and later in Central and Western African countries.^{1,2} In 2019, a newer vaccinia vaccine was approved to prevent the disease. Furthermore, investigations are still carried out on the same.

Animal-to-human (zoonotic) transmission can occur from direct contact with infected animals' blood, bodily fluids, or cutaneous or mucosal lesions. In Africa, evidence of monkeypox virus infection has been found in many animals, including rope squirrels, tree squirrels, Gambian pouched rats, dormice, different species of monkeys, and others. It was also found that eating improperly/half-cooked meat is also a cause. The disease spread outside Africa by infected travellers and imported infected animals. In 2018-2019, cases of monkeypox were confirmed in travellers from Nigeria, Singapore, the United Kingdom, and Israel. Human-to-human transmission can result from close contact with respiratory secretions and lesions of the skin.³

Risk groups include people with severe illnesses who require hospitalization or an immune-compromised person (HIV, leukaemia, etc); patients with comorbidities, a pediatric population less than eight years old, and pregnant or breastfeeding women.²

The incubation period is generally 6-13 days, but it can range from 5-21 days. The disease progression has two phases: The invasive phase (0-5 days), characterized by headache, fever, back pain, myalgia, fatigue and lymphadenopathy. The rash appearing phase (1-3 days) begins after the onset of the first phase and is characterized by the appearance of rashes on the face and then spreads up to the trunk and limbs of the body. Rashes evolve from macules (flat base lesions) to papules (firm lesions), then vesicles (clear fluid-filled lesions), and finally pustules (yellowish fluid-filled lesions) and crusts. It affects the face (in 95% of cases), palms of the hands, and soles of the feet (in 75% of cases). Also affected were oral mucous membranes (in 70% of cases), genitalia (30%), conjunctivae (20%), as well as cornea. Complications of monkeypox include pneumonitis, encephalitis, sight-threatening keratitis, and secondary bacterial infections.^{3,4}

Laboratory diagnoses include polymerase chain reaction (PCR) through specimens collected from body fluids and skin lesions.

No specific treatments for monkeypox infections are available. However, the Strategic National Stockpile (SNS) uses the following countermeasures to control the disease.

- Cidofovir– Drug approved for cytomegalovirus infections
- Vaccinia immune globulin intravenous (VIGIV)– Used to treat vaccinia vaccine complications such as eczema.
- Tecovirimat as oral (200mg) and injections were a medication used for smallpox infection in adults and pediatric patients.
- Brincidofovir is also a drug approved for smallpox infections.²

Preventive measures include avoiding contact with animals or humans who harbour monkeypox viruses, avoiding contact with anything contaminated by the infected, raising awareness of risk factors, and educating people about the measures they can take to reduce exposure to the virus are the main prevention strategies for monkeypox.³

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ADVERSE DRUG REACTIONS REPORTED TO AMC (APRIL – JUNE 2022)

Suspected Drug	Adverse Drug Reaction	Number (%) n=61
Tramadol + Acetaminophen	Constipation	1 (1.64)
Tramadol		1 (1.64)
Piperacillin + Tazobactam		2 (3.28)
Trypsin Chymotrypsin + Diclofenac		1 (1.64)
Amoxicillin + Clavulanic Acid	Vomiting	1 (1.64)
Pregabalin		1 (1.64)
Ceftriaxone		1 (1.64)
Meropenem	Diarrhea	1 (1.64)
Azithromycin		1 (1.64)
Ciprofloxacin + Tazobactam		1 (1.64)
Piperacillin + Tazobactam		1 (1.64)
Tramadol and Tramadol + Acetaminophen		1 (1.64)
Metronidazole	Nausea	2 (3.28)
Tramadol		1 (1.64)
Ciprofloxacin + Clarithromycin		1 (1.64)
Ceftriaxone		1 (1.64)
Clobazam		1 (1.64)
Diazepam		2 (3.28)
Lorazepam		1 (1.64)
Haloperidol		1 (1.64)
Ceftriaxone	Hypokalemia	3 (4.92)
Furosemide		2 (3.28)
Ciprofloxacin		1 (1.64)
Polymyxin B		1 (1.64)
Metformin + Glimepiride + Teneptin + Voglibose	Hypoglycemia	1 (1.64)
Human Insulin + Insulin Isophane		1 (1.64)
Cefotaxime	Skin rash	1 (1.64)
Vildagliptin		1 (1.64)
Piperacillin + Tazobactam		1 (1.64)
Acamprosate	Pruritis	1 (1.64)
Amoxicillin + Clavulanic Acid	Redness at site of injection	1 (1.64)
Ciprofloxacin	Redness and swelling	1 (1.64)

Suspected Drug	Adverse Drug Reaction	Number (%) n=61
Tamsulosin	Cough	1 (1.64)
Baclofen	Abdominal Pain	1 (1.64)
Aripiprazole	Akathisia	1 (1.64)
Lithium	Hyperthyroidism	1 (1.64)
Furosemide + Spironolactone	Hyponatremia	1 (1.64)
Baclofen	Breathlessness and cough	1 (1.64)
Heparin	Thrombocytopenia	1 (1.64)
Aspirin	Hematuria	1 (1.64)
Piperacillin + Tazobactam	Fever	1 (1.64)
Quetiapine	Drowsiness and Dry mouth	1 (1.64)
Metformin	Abdominal distress	1 (1.64)
Paracetamol	Facial puffiness and edema	1 (1.64)
Voglibose	Flatulence	1 (1.64)
Risperidone	Truncal dystonia	1 (1.64)
Clonidine	Chest pain	1 (1.64)
Ibuprofen	Gastritis	1 (1.64)
Metronidazole	Decreased urine output	1 (1.64)
Risperidone	Tremors and rigidity	1 (1.64)
Sodium Valproate	Dyspepsia	1 (1.64)
Naltrexone	Increase in LFT Value	1 (1.64)
Chlorpromazine	Obstipation	1 (1.64)
Risperidone	Vomiting and Abdominal Pain	1 (1.64)
Lorazepam + Haloperidol	Sleep Disturbance	1 (1.64)

**NEW DRUGS APPROVED BY CENTRAL DRUG STANDARD
CONTROL ORGANISATION (CDSCO)
(APRIL - JUNE 2022)**

Shivani. S*

Sl. No.	Name of Drug	Uses	Date of Issue
1.	Liothyronine sodium bulk and Liothyronine sodium tablets 5mcg & 20 mcg	To treat some of the more severe conditions in which the thyroid does not produce enough thyroxine, balance the effect of medicines used to treat an overactive thyroid.	04.04.2022
2.	Polyhexamethylene guanidine hydrochloride 1.000 lit	For surface disinfection.	06.04.2022
3.	Finerenone 10mg/20mg film coated tablets	Indicated to reduce the risk of sustained eGFR decline, end-stage kidney disease, cardiovascular death, non-fatal myocardial infarction and hospitalization for heart failure in adult patients with chronic kidney disease (CKD) associated with type 2 diabetes (T2D).	11.04.2022

Sl. No.	Name of Drug	Uses	Date of Issue
4.	Sugammadex sodium bulk and Sugammadex injection 100mg/ml (single dose vial for bolus injection, IV)	Reversal of neuromuscular blockade induced by rocuronium or vecuronium in adults undergoing surgery.	18.04.2022
5.	Nirmatrelvir bulk and Combipack of Nirmatrelvir 300mg tablets (2x150mg tablets) and Ritonavir tablets 100mg	For treatment of adult patients with COVID19, with SpO2 >93% and who have a high risk of progression of the disease including hospitalization or death.	21.04.2022
6.	Aviptadil bulk and Aviptadil injection (Each ml vial contains Aviptadil 15 mcg)	For treatment of patients with severe COVID19 with Acute Respiratory Distress Syndrome (ARDS).	29.04.2022
7.	Bempedoic acid bulk and Bempedoic acid tablet 180 mg	Indicated as an adjunct to diet and maximally tolerated statin therapy for treating adults with heterozygous familial hypercholesterolemia or established atherosclerotic cardiovascular disease requiring additional lowering of LDL-C.	09.05.2022
8.	rdESAT-6 bulk; rCFP-10 bulk and rdESAT-6 and rCFP-10 (Cy-Tb) Injection- Each vial (10 dose vial, single dose of 0.1ml) contains: rdESAT-6:0.05 mcg; rCFP-10: 0.05 mcg	For detection of Latent TB for population of 18 years and above.	09.05.2022
9.	Pralsetinib Capsule 100mg	<ul style="list-style-type: none"> ○ Indicated for the treatment of adult patients with metastatic rearranged during transfection (RET)fusion-positive non- small cell lung cancer ○ Indicated for the treatment of adult and paediatric patients 12 years of age and older with advanced or metastatic RET mutant medullary thyroid cancer who require systemic therapy. ○ Indicated for treating adult and paediatric patients 12 years and older with advanced or metastatic RET-fusion positive thyroid cancer who require systemic therapy and are radioactive iodine-refractory. 	26.05.2022

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https://cdsco.gov.in/opencms/opencms/en/Approval_new/Approved-New-Drugs/ [Last assessed on 28 June 2022]

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NEW DRUGS APPROVED BY U.S. FOOD AND DRUG ADMINISTRATION (FDA) (APRIL – JUNE 2022)

Harsha Harikumar*

Sl. No.	Name of Drug	Brand Name	Uses	Approved on
1.	Oteseconazole	Vivjoa	To reduce the incidence of vulvovaginal candidiasis in women with no reproductive potential.	April 2022
2.	Mavacamten	Camzyos	For the treatment of obstructive hypertrophic cardiomyopathy (class ii –iii) and to improve functional capacity and symptoms in adults	April 2022
3.	Vonoprazan, Amoxicillin and clarithromycin	Voquezna	To treat Helicobacter Pylori infection	May 2022
4.	Tirzepatide	Mounjaro	To improve blood sugar control in diabetes along with diet and exercise.	May 2022
5.	Tapinarof	Vtama	To treat plaque psoriasis.	May 2022
6.	Vutrisiran	Amvuttra	To treat polyneuropathy of hereditary transthyretin-mediated disease.	June 2022

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<https://www.fda.gov/drugs/new-drugs-fda-cders-new-molecular-entities-andnewtherapeutic-biological-products/novel-drug-approvals-2022> [Last assessed on 29 June 2022]

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DEPARTMENT OF PHARMACY PRACTICE NEWS

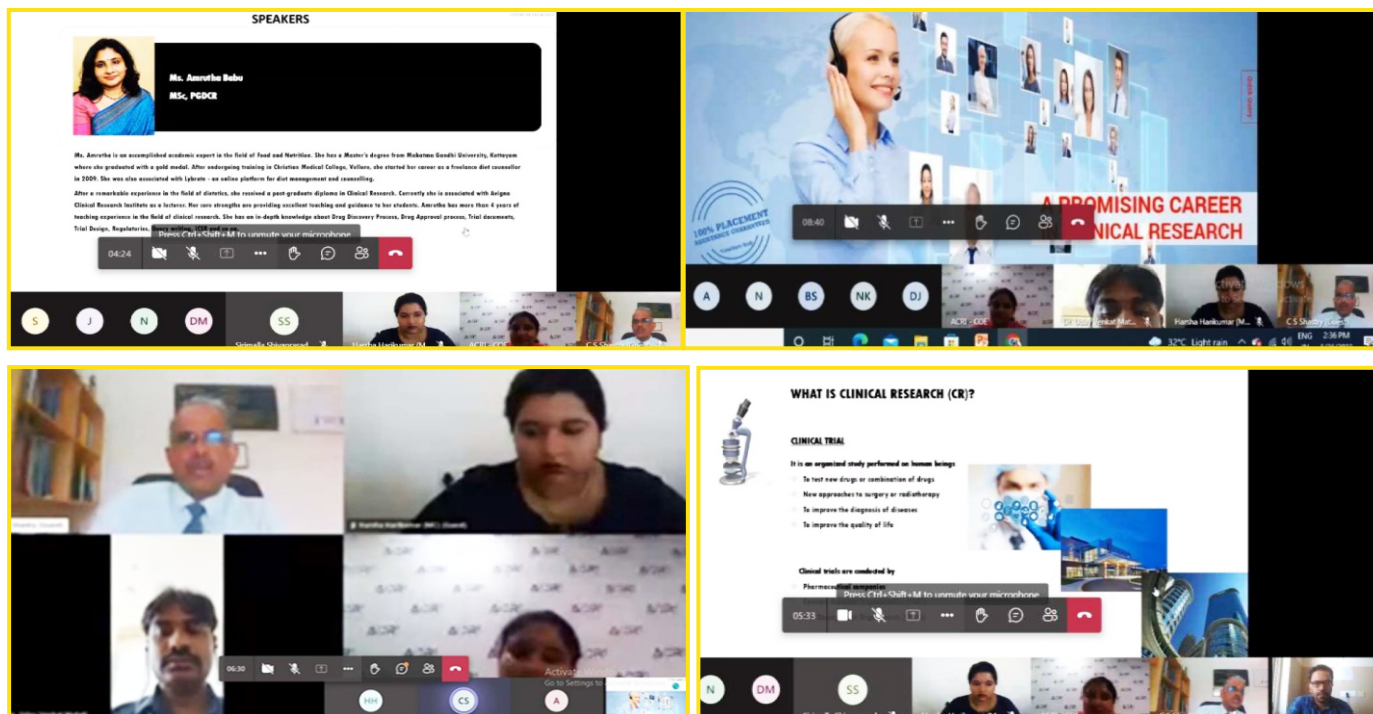
WORKSHOP ON "STATISTICAL ANALYSIS USING R PROGRAMMING SOFTWARE"

The Department of Pharmacy Practice, NGSM Institute of Pharmaceutical Sciences jointly with the Department of Biostatistics, K.S. Hegde Medical Academy (KSHEMA) organized a workshop on "Statistical Analysis Using R Programming Software" on 5th & 6th May 2022 at NGSMIPS, Paneer Campus, Deralakatte, Mangaluru. The resource persons for the event were Ms. Yashaswini, Assistant Professor, Department of Statistics, Yenepoya (Deemed to be University), Mangaluru and Ms. Shraddha Shetty, Lecturer, Department of Biostatistics, KSHEMA, Mangaluru.



WEBINAR ON "EMERGING CAREERS IN CLINICAL RESEARCH (CAMPUS TO CUBICLE)"

The Department of Pharmacy Practice of NGSM Institute of Pharmaceutical Sciences organized a webinar on "Emerging Careers in Clinical Research (Campus to Cubicle)" on the 26th of May 2022. The guest speaker for the event was Ms. Amrutha Babu of Avigna Clinical Research Institute, Bengaluru.



NGSM Institute of Pharmaceutical Sciences



Nitte Institutions

Health Science Institutions, Hospitals and Research Centres

1. K.S. Hegde Medical Academy, Mangaluru
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5. Nitte Institute of Physiotherapy, Mangaluru
6. Nitte Institute of Medical Laboratory Sciences, Mangaluru
7. Nitte Institute of Speech and Hearing, Mangaluru
8. Justice K. S. Hegde Charitable Hospital, Mangaluru
9. Nitte Meenakshi Institute of Craniofacial Surgery, Mangaluru
10. Leela Narayana Shetty Memorial Cancer Institute, Mangaluru
11. Nitte-Gajria Hospital, Karkala
12. Kshema-IVF: Fertility & Reproductive Medicine Centre, Mangaluru
13. Nitte Rural Psychiatry Centre, Nitte.
14. Kowdoor Gopal Hegde & Smt. Manorama Hegde Hospital, Bailur.
15. Nitte University Centre for Science Education & Research (NUCSER), Mangaluru
16. Nitte University Centre for Animal Research & Experimentation (NUCARE), Mangaluru
17. Nitte University Centre for Stemcell Research & Regenerative Medicine (NUCSReM), Mangaluru

Engineering Institutions

18. Nitte Mahalinga Adyanthaya Memorial Institute of Technology, Nitte
19. Nitte Meenakshi Institute of Technology, Bengaluru
20. Nitte Institute of Architecture, Mangaluru

Management Institutions

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23. Sarosh Institute of Hotel Administration, Mangaluru
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35. Nitte International School, Bengaluru
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