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Action research on athletes' need for information to avoid inadvertent doping (work in progress)

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Background: Athletes test positive for prohibited substances (according to WADA prohibited list) occasionally. Athletes' use of pharmaceuticals is occasionally highlighted in media, often times due to an athlete accidentally testing positive for prohibited substances. The athletes have the responsibility but may have challenges getting reliable information to avoid inadvertent doping. When tested, the athletes deliver a self-declaration form (doping control form), stating amongst others what pharmaceuticals and supplements they have used the foregoing seven days. The forms can be a valuable information source on trends in use of pharmaceuticals and supplements. Action research consists of a repeated circle identifying a problem, collecting and analysing data and reflecting on the analysis leading to the next round of identifying a problem etc. Purpose: To find ways to help athletes in reliably shouldering the responsibility for a safe own use of pharmaceuticals and food supplements. To evaluate if Action Research is a useful approach towards this aim.

Method: Action Research, researchers from Anti-Doping Norway and the University of Oslo in cooperation with umbrella organizations for the different types of sport. 1st round: the doping control forms entered into a database, the pharmaceuticals arranged by the ATC classification and the food supplement by another classification. Patterns identified.

2nd round: athletes in sports with a pattern deviating from the average interviewed in focus groups to identify reasons for the deviations. Many groups mention support staff as reliable providers of information.

3rd round: support staff interviewed in individual interviews. Many of the informants mention pharmacies as a reliable place for information and a reliable place to buy food supplements.

4th round: Simulated patient in pharmacies. The quality of the information varies.

5th round: individual interviews with pharmacists. The pharmacists are willing to take on an extended role in informing athletes on safer routines as regards pharmaceuticals.

6th and 7th rounds planned: interviewing athletes and surveying to map further the potential pharmacies might have as a provider of information and services.

The rounds will continue until a plan for providing adequate services for the athletes has been developed.

Results: Among the identified trends in 1st round were ice-hockey players' unusual liberal use of hypnotics, handball and football players' relatively liberal use of painkillers and certain endurance sports athletes' relatively large use of anti-asthmatics. The groups of athletes that have already been interviewed in 2nd round are: ice-hockey players, handball players and young football players. These groups directed the focus to support staff, whereof physicians and physiotherapists are being interviewed in 3th round. In the 5th round, insufficient knowledge among community pharmacists was revealed. The 6th and 7th rounds have started but are not yet completed.

Conclusion: Action Research seems to be a useful approach towards the aim of developing a pharmacy service that can complement the information service provided by Anti-Doping Norway.

Health literacy and understanding of pharmacists' instructions among urban and rural patients: A survey-based study

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Introduction: Health literacy plays a fundamental role in ensuring patient's ability to understand and follow medication instructions provided by healthcare professionals. Pharmacists, as key providers of medication-related education, are particularly important in settings where access to other healthcare professionals may be limited, such as rural areas. Understanding how patients comprehend pharmacists' instructions and identifying potential gaps in communication can inform more effective health interventions and promote better medication adherence.

This study investigates differences in health literacy and pharmacist-patient communication preferences between urban and rural populations. By identifying disparities in understanding, it aims to provide insights into improving communication strategies tailored to diverse patient needs.

Method: A cross-sectional survey was conducted among pharmacy patients in the cities of Bjelovar and Karlovac, Croatia, from January to March 2025. Participants provided demographic information, including age, gender, education level, and area of residence (urban or rural). The survey assessed various aspects of health literacy, including: confidence in understanding pharmacists' instructions, frequency of reading medication leaflets, ease of understanding medical terminology, comfort level in seeking clarification from pharmacists, preferred methods of receiving medication-related information, the extent to which pharmacists provide guidance on over-the-counter (OTC) medications.

Descriptive and comparative statistical analyses were performed to explore variations between urban and rural participants.

Results: Urban respondents were more confident (77.5%) in understanding medication instructions than rural respondents (68.8%), though more rural participants (27.3%) reported partial confidence. Reading frequency of medication leaflets was similar, but 15.6% of rural respondents admitted to rarely or never reading them, compared to 21.0% of urban participants. While 44.9% of urban respondents found medical terminology easy to understand, this percentage was higher among rural respondents (53.2%). Comfort in asking pharmacists questions was slightly greater in urban areas

(61.6% vs. 57.1%). Urban respondents preferred verbal information (50.0%), while rural participants leaned toward written (41.6%) or digital formats (2.6%). Pharmacists in rural areas were more likely to proactively provide OTC medication instructions (68.8% vs. 57.2%).

Conclusion: These findings highlight key differences in health literacy and communication preferences between urban and rural patients. While urban respondents exhibited greater confidence in understanding medication instructions and demonstrated a stronger preference for verbal counselling, rural patients relied more on written materials but were also less likely to read them. The results suggest that pharmacists should employ a range of communication strategies, such as simplifying verbal explanations for rural patients while integrating digital resources to better support urban populations.

By tailoring counselling approaches to address varying health literacy levels, pharmacists can play a critical role in enhancing patient comprehension, improving medication adherence, and ultimately contributing to better health outcomes across diverse communities. Further research is warranted to explore additional factors influencing health literacy and to develop targeted interventions aimed at reducing disparities in pharmacist-patient communication.

Shaping the future of cell therapies in Portugal: Defining a strategic agenda for improved access and policy development

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Background: Chimeric Antigen Receptor T-cell (CAR-T) therapy is an innovative therapeutic approach in the treatment of B-lineage lymphoid neoplasms, especially in cases where first-line therapeutic options are ineffective or lose their efficacy over time. The journey of the patient eligible to receive CAR-T cell therapy is complex, presenting some significant challenges to its accessibility.

Purpose: This study aims to reflect on and discuss the future of cell therapies in Portugal, with a particular focus on CAR-T cell therapy. It aims to promote the development of a strategic agenda with a potential impact on the definition of public policies that improve access to this technology and on scientific and clinical progress in CAR-T cell treatment.

Method: A targeted literature review was conducted, followed by a Think Tank approach resorting to design thinking techniques. The study was led by a research team at NOVA Information and Management School (NOVA University of Lisbon) and guided by a Steering Committee of four national experts. The Think Tank consisted of three

meetings involving 26 participants from the Portuguese healthcare sector, including health professionals, patients, caregivers, researchers, and policy and executive decision-makers. The first meeting focused on the evidence, diagnosis, and referral process for CAR-T therapy-eligible patients; the second examined financial models; and the third discussed the management and governance of the patient journey.

Results: Following the results of the three Think Tank sessions, five key axes of action were identified to improve access to cell therapies in Portugal. The first axis of action is to invest in the capacity building of healthcare professionals and services. The second is to establish a centralized financing program. The third is to create a national referral network for cell therapies and standardize treatment eligibility criteria. The fourth is to provide comprehensive socio-economic, logistical, and training support for patients, caregivers, and families. Lastly, the fifth axis of action is to strengthen the ability to generate and share real-world evidence in the field of cell therapies. Implementing the proposed recommendations is expected to enhance the patient's journey, which is crucial in the experience of a cancer patient whose first lines of treatment have already failed.

Conclusion: The findings and recommendations from this study aim to inform policy decisions and foster adoption of cell therapies for patients living in Portugal. Although the study focuses on a national case study, its methodology, which involves engaging all parties' perspectives in reflecting on the adoption of personalized therapies, may offer valuable insights for adaptation in other countries.

Antimicrobial susceptibility testing of *Klebsiella pneumoniae* recovered from urine samples

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Introduction: Antimicrobial resistance (AMR) is a growing global health challenge, with microorganisms becoming increasingly resistant to antibiotics. *Klebsiella pneumoniae* plays a significant role in this menace, demonstrating multidrug resistance and the ability to transfer resistant genes. This poses serious health risks, including poor therapeutic outcomes and death. Additionally, Extended Spectrum Beta-Lactamase (ESBL) production in *Klebsiella pneumoniae* enables hydrolysis of extended-spectrum antibiotics, further complicating treatment options. In Ghana, *Klebsiella pneumoniae* infections are prevalent, accounting for 74.1% of *Klebsiella* isolates in a study conducted at Komfo Anokye Teaching Hospital. Despite this,

data on drug resistance and ESBL prevalence in Ghana remains limited. Furthermore, West Africa has been identified as having significant information gaps concerning multidrug resistant Gram-negative bacteria, including *Klebsiella pneumoniae*.

Objective: This study investigated the antimicrobial susceptibility patterns and prevalence of ESBL in *Klebsiella pneumoniae* cultured from the urine of patients in Ghana.

Method: The study was carried out at the Bacteriology Department of the Noguchi Memorial Institute of Medical Research, University of Ghana. A total of seventy (70) isolates from three hospitals were used for this study. Ten (10) from Eastern Regional Hospital, twelve (12) from University of Ghana Hospital and forty-eight (48) from 37-Military Hospital. These isolates were collected from processed clinical specimen from the urine of patients presenting with urinary symptoms. This study involved four main steps, a. Culturing and subculturing of isolates. b. Identification of isolates using Matrix Assisted Laser Desorption Ionization Time of Flight Mass Spectrometry (MALDI TOF MS). c. Antimicrobial Susceptibility Test using the Kirby-Bauer disc diffusion method to determine the antimicrobial susceptibility profile of *Klebsiella pneumoniae* and d. Phenotypic detection of ESBL. A confirmatory test using the combination disc test was done to identify *Klebsiella pneumoniae* isolates that were ESBL producers. Data analysis was done using WHONET 2022 and Microsoft Excel.

Results: Out of the 70 isolates, 55 were identified to be *Klebsiella pneumoniae*. The antimicrobial resistance profile of *Klebsiella pneumoniae* from this study was Ampicillin (98.2%), Trimethoprim/Sulfamethoxazole (65.5%), Cefotaxime (54.5%), Norfloxacin (23.6%), Cefuroxime (50.9%), Ceftazidime (45.4%), Tetracycline (47.3%), Gentamicin (38.2%), Amikacin (10.9%), Meropenem (5.5%), Ciprofloxacin (38.2%), Ceftazidime (38.2%) and Chloramphenicol (30.9%). Thirty-nine (39) of the 55 *Klebsiella pneumoniae* isolates identified (70.9%) were multi drug resistant (MDR), 15 of them (27.27%) were possibly extensively drug resistant (XDR) and 1 of them (1.8%) was possibly pan drug resistant (PDR). Forty-nine (49%) of the *Klebsiella pneumoniae* isolates were described as potential ESBL producers. Out of this figure, 74% were found to be ESBL positive.

Conclusion: This study reveals high antimicrobial resistance rates in *Klebsiella pneumoniae*, including MDR, XDR, and ESBL-producing strains, posing a serious threat to treatment efficacy in Ghana. Strengthened antibiotic surveillance, stricter enforcement of the National Action Plan on AMR, and nationwide research are needed to estimate the national burden, combat resistance and improve infection management strategies.