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CONFERENCE ABSTRACTS

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Health and medicines information

Electronic medicines management systems and medicines administration errors: A qualitative thematic analysis

Laura Lindsey*, Hayley Hogg, Adam P Rathbone

Newcastle University, United Kingdom

** laura.lindsey@ncl.ac.uk*

Introduction: Electronic prescribing systems are increasingly utilised across health care providers to reduce medicine administration errors by eliminating any ambiguity associated with handwritten drug charts. The main objective of this study was to analyse medicine administration errors documented on Datix reports qualitatively collected from an NHS trust in the UK. This allowed a detailed description of the content through qualitative thematic analysis surrounding the differences of errors reported pre and post-the introduction of ePMA, along with the differences between early and late adopters.

Methods: Medicine-related data reports were extracted and anonymised from eight locations within the trust. Each Datix report was then categorised by location and separated before and after the implementation of ePMA. Thematic analysis was used to analyse the data, and NVivo was used to code the Datix reports inductively. Five main themes emerged from the data and were grouped with associated subthemes.

Results: The five emergent themes were: prescribing process, administration, discharge process, errors, and medication. The analysis found an overall reduction in the majority of mistakes reported post-intervention. However, findings suggest that there is an element of human influence affecting the errors that were reported.

Conclusions: Electronic prescribing systems like eMeds can improve patient safety during hospital stays. Nevertheless, this depends upon the staff using the software, and errors will likely be generated if the system is misused. Therefore, this study has highlighted areas of improvement that can be utilised to enhance their quality of care further.

Pharmacist information system (SIAp): It's cursed or a blessing in disguise during a pandemic

Rudi Hendra[1,2]*, Agus Sulaeman[1,3], Catleya Febrinella[1,4], Fauzan Zein Muttaqin[1,5] ,Noffendri Rustam[1], Nurul Falah Eddy Pariang[1], Sherly Melianti[1], Hilwan Yuda Teruna[1,2]

[1] The Indonesian Pharmacists Association, Indonesia

[2]Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Riau Riau, Indonesia

[3]Department Pharmacology and Clinical Pharmacy, Faculty of pharmacy, Universitas Bhakti Kencana, Indonesia

[4]Indonesian Pharmacists Association, Provincial Organiser, Indonesia

[5]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of pharmacy, Universitas Bhakti Kencana Indonesia

** rudi.hendra@lecturer.unri.ac.id*

Introduction: COVID-19 has impacted the program delivery of many organisations worldwide, where face-to-face delivery has been converted to virtual delivery. This includes the professional leadership body in Indonesia, the Indonesian Pharmacists Association (IAI), to creatively develop and modify their ways of professional service to their members. The professional services IAI provides include pharmacists' registration provision, letter

recommendations provision, continuous learning activity platform, and professional recertification provision at the regency, provincial, and central levels. The IAI developed an online application system, the Pharmacist Information System (SIAp), in 2019. With SIAp, professional services for members are hoped to be efficient, precise, friendly, convenient, and transparent. SIAp has been applied for three years. Some obstacles were observed, including a lack of familiarity with how to use it, inaccurate information completed by members, and the desire of some parties to utilize manual/paper-based services. The IAI monitors and evaluates the SIAp application regularly to provide the best services to members.

Objectives: This study aims to explore members' satisfaction with using SIAp from 2020 to 2022.

Methods: A five-category of the Likert scale was used to identify satisfaction levels. Once members submitted requests or services via SIAp, they were asked about their satisfaction by answering a question on how much satisfaction they were with the services (rated from 1 to 5 stars).

Results: A total of 80,492 responses were collected. Approximately 66.9% (53885) of respondents are satisfied with the services provided, while 0.01 % (118) express disappointment. Indonesian pharmacists are generally happy with SIAp services to support their practice.

Conclusions: SIAp is a blessing in disguise during the pandemic and in the future. Further study could be done to explore the perception of those who are unsatisfied with how to improve SIAp services. It is also hoped that this SIAp application will enable the development of data-driven policies in the organisation and collaboration with the government and industry.

An update on the anticholinergic burden for Pharmacy researchers and practitioners

Ian Maidment[1]*, Chris Fox[2], Kathryn Richardson[3], Frank Moriarty[5], Phyo Mynt[4]

[1]*Aston University, Birmingham, United Kingdom*

[2]*Exeter University, Exeter, United Kingdom*

[3] *University of East Anglia, Norwich, United Kingdom*

[4]*University of Aberdeen, Aberdeen, United Kingdom*

[5]*Royal College of Surgeons in Ireland, School of Pharmacy and Biomolecular Sciences, Ireland*

** i.maidment@aston.ac.uk*

Introduction: Many medicines possess anti-cholinergic activity and are associated with adverse events such as confusion, tachycardia, blurred vision and constipation. There is increasing evidence that drugs with significant anti-cholinergic activity are particularly damaging in older people at risk of dementia. Pharmacy practitioners working in all areas must understand the risks associated with anticholinergics, particularly the potential over-the-counter availability of oxybutynin. This work summarises the Anti-cholinergic Research Team's (ACRT) research evidence.

Objectives: To summarise the recent research from the anticholinergic research team on the anticholinergic burden.

Methods: Various methods were used to produce the evidence.

1. A cross-sectional study examined associations between the total anti-cholinergic burden (ACB) and inflammatory markers in the European Prospective Investigation into Cancer cohort study.

2. The prevalence of anticholinergic use in England's older population was estimated using data from participants aged 65+ years in the Cognitive Function and Ageing Studies (CFAS I and II).

3. A systematic review and meta-analysis of relevant studies examined the relationship between anticholinergics and the risk of dementia/cognitive impairment.

4. One of the most extensive case-control studies using data from Clinical practice research Datalink (CPRD), estimated the association between anticholinergics and subsequent incident dementia. Another cohort study was conducted using The Irish longitudinal study on ageing (TILDA) cohort.

Results: Higher ACB scores were associated with higher levels of key inflammatory markers. The prevalence of potent anticholinergic use increased from 5.7% to 9.9% in the 20 years between CFAS I and II. The systematic review of 26 studies found that anti-cholinergic use was associated with incident dementia and cognitive decline. However, observational studies were associated with a significant risk of bias, and high-quality research is required. In the case-

controlled study using CRPD, 14,453 (35%) cases and 86,403 (30%) controls were prescribed at least one potent anti-cholinergic medication. An increasing average anti-cholinergic burden was associated with dementia. In TILDA, new anticholinergic use was associated with impaired recall but not cognition or animal naming. In the CRPD study, a class effect was observed: potent anticholinergic antidepressants and urological and antiparkinson agents were associated with an increased risk of dementia, but powerful gastrointestinal agents were not.

Conclusions: While the prevalence of anticholinergic use is increasing, there is much to learn about the anticholinergic burden. First, we need to identify precise biomarkers. Second, we need to identify the impact of anticholinergic medications on real-world clinical outcomes. To support this, there needs to be an internationally standardised system to rating anticholinergic burden linked to online prescribing data.

Paper or electronic drug information leaflet

Mia Karlsen[1,2,3]

[1]*Copenhagen University, Denmark*

[2]*South Danish University, Denmark*

[3]*Odder Pharmacy, Denmark*

** miakarlsenherns@gmail.com*

Introduction: In the EU, all drug packages are legally required to contain a package insert leaflet (PIL) with medicine information for the user. The Nordic Pharmaceutical Union (NFU) recommends that Nordic countries work for the use of electronic package information (ePI) for drugs instead of written drug information. EPI may increase patient safety due to faster updates and the possibility of individualised access, such as bigger text size, read-aloud, and language choice. However, information on the patient's current use of the PIL and attitude towards using ePI is essential before introducing a change in information practice.

Objectives: To explore the public attitude towards and knowledge of digital drug information and related apps and to map information sought in the PIL or online.

Methods: A questionnaire was presented by 11 pharmacy interns to customers who purchased prescription medication in Danish community pharmacies. When customers buy a drug at the pharmacy counter, they complete the questionnaire on a tablet or paper. All data were transferred into a database and accordingly analysed. The interns collected data over four half weekdays, distributed over different days, mornings, and afternoons to get customers who might shop on other times and days.

Results: 407 questionnaires completed by customers aged 15-71+ years were collected between March-May 2021. Over all, 56,5 % of the customer found it was all right to remove the PIL and replace it with electronic information. Among customers older than 71 years, the percentage was 87. The information most often read in the PIL was about adverse reactions (72%) and information about the usage of the medication (52%).

Conclusions: Most pharmacy customers read the PIL, and information about usage and adverse reactions was most often sought. More than half of the pharmacy customers would be satisfied with electronic package information instead of PIL. The result from the project can be utilized for optimising the usage of information, including the issue of climate and “green thinking.”

A new self-report tool for the extent to which consumers follow directions (FDs) for non-prescription medicines (NPMs) provided on packaging or advice from healthcare professionals - The FD-NPM scale

Stephen Carter, Si Kei Vong, Lifeng Kang

School of Pharmacy, University of Sydney, Australia

**stephen.carter@sydney.edu.au*

Introduction: Non-prescription medicines (NPMs), while relatively safe, are responsible for a small but significant proportion of medication misadventures, and inappropriate use may lead to avoidable healthcare costs. Some consumers appear to vary their use of NPMs from the directions provided on packaging or advice from healthcare professionals. Consumers may use NPMs at lower doses or less frequently than directed because of the perceived risk of side effects (risk perception). Research on this topic shows inconsistent relationships because there are no validated self-report measures for consumers’ adherence to directions.

Objectives: This study aimed to develop and validate a measure for consumers’ self-reports of following directions (FDs) for NPMs, the FD-NPM scale. Secondly, the study explored the relationship between risk perception and FD-NPM.

Methods: The FD-NPM scale was modelled on tools for self-reported adherence to prescription medicines. Unlike the case for prescription adherence, items were developed to allow participants to report overuse and underuse. Items elicited how frequently over the past month, consumers recalled following directions and were content validated with an expert panel. A cross-sectional study was administered online to participants from an Australian

agency conducting consumer research. Participants were Australian adults who had used any NPMs within the last month. Factor analyses were used to validate the FD-NPM scale. Structural equation modelling (SEM) explored the relationships between risk perception, covariates, and FD-NPM.

Results: The expert panel resulted in acceptable average content validity index (CVI) scores for relevancy (0.98) and ease of understanding (1.0). There were 403 participants recruited to complete the survey. Less than 20% of "always" or "often" self-reported following directions for dose, frequency, or duration of use. EFA (n=207) revealed two moderate factors, with four items loading onto an underuse factor and four loading onto an overuse factor. CFA confirmed that the two elements were positively correlated (r=0.46). This indicates that consumers who self-reported underusing NPMs were more likely to overuse them. The fit statistics for the SEM were excellent, and the model explained 38% of the variance of FD-NPMs. Consumers with high-risk perceptions towards non-prescription medicines, those who were younger, and those who were more educated had a greater tendency not to follow directions.

Conclusions: A new self-report measure for consumers' adherence to NPM directions (the FD-NPM scale) was developed and validated. Despite the considerable effort in planning how NPM information is presented on labels, product information, or spoken by health professionals, some consumers will make autonomous and independent decisions to use NPMs as they see fit. Overuse is a problem. While underuse may not be a safety issue, using lower than the therapeutic amount of a range of NPMs could lead to unnecessary discomfort and excess burden on the health system if consumers then go on to require medical and hospital services. That increasing risk perception is associated with both overuse and overuse NPMs is of great interest to clinicians and policymakers who are required to manage risk communications.

Impact of COVID-19 pandemic on consumers' access to essential medicines in Nigeria

Chima Amadi[1]*, Emmanuel Nwoke[2], Chinelo Ofomata[3], Chiamaka Jibuaku[3]

[1]National Institute for Pharmaceutical Research and Development, Abuja, Nigeria

[2]University of Port Harcourt, Port Harcourt, Nigeria

[3]Nnamdi Azikiwe University, Awka, Nigeria

** chima.amadi001@gmail.com*

Introduction: COVID-19 is a global pandemic that has seriously impacted nations' economies. Access to essential medicines is of utmost importance.

Objectives: This study examined the impacts of the COVID-19 pandemic on the ease of access to essential medicines by end users.

Methods: A cross-sectional survey using electronic questionnaires was conducted on study participants across the 36 states of Nigeria. They were assessed on sociodemographics, health characteristics, and challenges accessing essential medicines during the COVID-19 pandemic. Data were analysed using the Statistical Package for the social sciences (SPSS version 20, IBM, Armonk, NY). The pandemic's overall impact was operationalised as < 60.0% or 60.0% access to essential medicines by respondents as maximal and minimal impact, respectively.

Results: The results showed that 35.2% of the respondents managing chronic illnesses had difficulties accessing essential medicines during the COVID-19 lockdown, with 84.0% experiencing deteriorating chronic health conditions due to difficulty accessing their medicines. The proportion of respondents who sourced for orthodox treatments before the COVID-19 lockdown (98.4%) was significantly ($P < 0.05$) higher than that of those who sourced for the same during the lockdown (89.0%). An increase in the cost of medicines was observed by 77.7% of participants, with 73.9% of respondents living with chronic illness affirming that their income was negatively affected by the pandemic.

Conclusions: The COVID-19 pandemic had minimal impact on consumers' access to essential medicines. However, significant challenges identified were poor availability of means of transportation, reduced income, high cost of drugs, and fear of contracting the virus.

Pharmacists' Perspectives on asthma treatment in primary care centres in Kuwait

Amnah Taqi[1], Adam Rathbone[1], Gill Rowlands[2]

[1] Newcastle University, School of Pharmacy, Faculty of Medical Sciences, United Kingdom

[2]Newcastle university, Population and Health Sciences Institute, Faculty of Medical Sciences, United Kingdom

** a.h.h.a.a.taqi1@newcastle.ac.uk*

Introduction: Asthma is a respiratory disease caused by chronic airway inflammation in the lungs that constricts the airway and increases mucus production. Asthma is Kuwait's most common chronic disease. Pharmacists can play critical roles in supporting optimal health outcomes for patients with asthma.

Objectives: In Kuwait, there is limited evidence describing pharmacists' experiences of asthma treatment in primary

care centres. This study aims to identify pharmacists' perspectives on asthma treatment in primary care centres in Kuwait.

Methods: Pharmacists were recruited via convenience sampling and passive snowballing techniques. Qualitative, online semi-structured interviews were conducted via Zoom. Recorded interviews were transcribed verbatim and analysed using NVivo® 11 software. Data were inductively analysed to identify themes using the Braun and Clarke framework.

Results: A total of 15 interviews with pharmacists were conducted. The sample consisted of more females (n=13) than males (n=2). Most pharmacists had working experience five-ten years as pharmacists in primary care centres (n=9). Also, most of them worked in primary care centres in Al-Asema (the capital) district (n=7). Pharmacists described their roles as dispensing medications prescribed by doctors and demonstrating inhalation techniques for first-time users of inhalers. Pharmacists reported limited authority to alter asthma treatment but showed interest in expanding their role in asthma care.

Most pharmacists believed physicians had the most significant role in asthma management, and patients trusted physicians more than pharmacists to manage their asthma. Many factors influenced pharmacists' involvement in asthma services, including time, consultation room space, low levels of knowledge, and patients' and physicians' attitudes to pharmacists. Additionally, poor access to patients' medical and health information and the absence of job descriptions for pharmacists in Kuwait were considered barriers to delivering asthma care services. Interprofessional collaboration, task delegation, role clarification, and additional training were reported as needed to provide asthma care services in primary care centres.

Conclusions: There is potential for pharmacists to contribute to asthma care services in Kuwait. However, poor access to patient information and the absence of job descriptions for pharmacists in Kuwait may limit pharmacists' involvement in asthma services. A limitation of this study is that pharmacists were mostly from the capital, so findings may not apply to Kuwait.

The importance of the use of biosimilars in practice, advantages and disadvantages

Svjetlana Loga- Zec[1]*, Mensura Asceric[2]

[1]Institute of Pharmacology, Clinical Pharmacology and Toxicology, Faculty of Medicine, University of Sarajevo, Bosnia and Herzegovina

[2]Department of Pharmacology and Toxicology University Of Tuzla, Bosnia and Herzegovina

** svjetlana.loga@mf.unsa.ba*

Introduction: The availability of biological agents greatly impacted the change of therapeutic algorithms for many chronic diseases, including inflammatory immune disorders and various cancers. Still, the approach to biological therapy isn't the same in all countries, and availability is limited because of financial reasons. Biosimilars can increase the availability of this therapy since their prices are almost 30% lower. Greater availability of these drugs can have many clinical advantages, such as potentially earlier administration of biological treatment and better clinical outcomes. This also helps reduce the direct and indirect costs of chronic disease therapy. Still, there are many obstacles facing the implementation of biosimilars in everyday clinical practice.

Objectives: This project describes the importance of using biosimilars in practice, its advantages, and disadvantages.

Methods: Biosimilars developers must implement plans of pharmacovigilance and risk control to proactively assess potential risks after the biosimilar is made available on the market, including a safety profile on how to prevent or minimize potential risks, research plans which would provide more information on the effectiveness and safety of the drug, risk factors for adverse effects, and calculating measures for risk reduction. Contrary to non-biological drugs, additional requests for post-marketing surveillance of biosimilars is required because of their shortened availability process and lack of data on the long-term safety of these drugs.

Results: Even though there is concern that the implementation of biosimilars could lead to increased immune responses, worsening of adverse effects, or reduction of therapeutic effectiveness, an increasing number of studies claim that replacement of the original drug with its corresponding biosimilar has no impact on clinical outcome. Systematic reviews of previous studies of drug replacement support these claims.

Conclusions: Moreover, continuous post-marketing surveillance can increase trust in the safety and effectiveness of biosimilars in patients and doctors and lead to increased implementation of these drugs. This can lead to more accessible access to biological therapy for patients, improving individual care outcomes and decreasing the costs of chronic disease therapy.

The need for the global identification of medicinal products

Leonora Grandia[1]*, A. Rozema[2], M. Fladvad[3]

[1]Z-index, Sweden

[2]Medicines Evaluation Board, Sweden

[3]Uppsala Monitoring Centre, Sweden

*leonora.grandia@z-index.nl

Introduction: The identification of medicinal products is a global issue. Today's situations that call for international and unique identification of medicinal products include:

1. Providing healthcare providers with appropriate, complete, and understandable medicinal product information when prescribing and dispensing medications and considering the increasingly mobile population that receives medical services and medicinal products from different healthcare providers that could be located in other countries, jurisdictions, or simply in different healthcare systems.

2. Reporting and analysing adverse drug events (ADEs) and medication errors. Using international identification of medicines makes it much easier and faster to aggregate adverse drug event reports from different countries, allowing WHO-UMC to alert safety issues faster globally.

3. The recent pandemic showed the importance of global identifiers. There is high interest in monitoring populations vaccinated with each available vaccine and their associated safety and efficacy results over time.

These needs should be addressed using the ISO Identification of medicinal products suite of standards (IDMP). These standards describe four levels of granularity for the description of medicines: (1) Substances; (2) Pharmaceutical product (PhPID; substance(s), dose form and strength); (3) Medicinal product (MPID); (4) Packaged medicinal product (PCID). Unambiguous identification of the substances is the basis of a unique, global identification of medicinal products.

A global PhPID is essential because it provides a "common denominator" from country-to-country regardless of where it is prescribed, dispensed, and used. Furthermore, the PhPID can be used to identify medicinal products on an aggregated level, e.g., to find substitutions for the initially prescribed medicine by the health care professional or – in case of a pandemic like the recent COVID-19 pandemic - to aggregate vaccination data across regions around the world.

The global IDMP standards are available, but the implementation is still momentum.

Objectives: The European H2020 UNICOM project aims to implement European IDMP standards. An essential aspect of the implementation is that the IDMP-IDs will be in place.

Methods: In the UNICOM project, the implementation of IDMP is undertaken through different work packages and related working groups. Existing data are cleansed and enriched for substances based on the IDMP standard. For developing a global PhPID, the Global IDMP working group, led by WHO-UMC, US-FDA, and EMA, has worked on a standardised method for creating PhPIDs.

Results: The substance data in the EMA database (SMS) are cleansed. An ISO-IDMP-compliant system (EU-SRS) is being implemented, capturing scientifically sound substance records built according to the IDMP standards. WHO-UMC has developed criteria for creating global PhPIDs, and this process is being tested in a pilot project.

Conclusions: With access to the standardised information in local MPDs, doctors and pharmacists can more safely and efficiently prescribe and dispense medicinal products to patients and those away from home. In case of shortages or unexpected ADEs, public health authorities can, more efficiently and safely, identify substitutions and potentially recall harmful products and substances, not just specific brands.

Benefits of identification of medicinal products (IDMP) for Medicinal product dictionaries

Leonora Grandia[1]*, U. Tschorn[2], J.M. James[3], R.H. Vander Stichele[4], J. Millar[5]

[1]Z-index, Sweden

[2]IDMP1 GmbH, Sweden

[3]Blue Wave Informatics, Sweden

[4]I-HD, Sweden

[5]SNOMED International, Sweden

* leonora.grandia@z-index.nl

Introduction: A medicinal product dictionary (MPD, drug database) plays a central role in providing data for storing and sharing information on medicinal products for patients' prescription and dispensation and related processes like reimbursement, supply chain, and pharmacovigilance. The MPD offers a structured repository of information to describe medicines and their safe use and supports many use cases like prescribing, dispensing, ordering, pricing, and reimbursement. The primary users of an MPD are health care professionals in hospitals, private practices, retail pharmacies, and others via the clinical systems that they use. But also, wholesalers, pharmaceutical companies, health insurance companies, and patients benefit from an MPD.

In an MPD, the medicinal products are usually described on different levels of granularity. The primary levels of granularity are the level of the active substance(s), the combination of meaning (s)/dose form/strength, the medicinal product, and the packaged medicinal product. These levels serve different purposes, like generic prescribing, identification of appropriate substitutions in case of shortages, or registration of the same package dispensed to the patient. The providers of medicinal product dictionaries (MPDs) and clinical decision support (CDS) use variable resources to confirm the identity of therapeutic product information received from pharmaceutical companies. This approach has produced a fragmented network of processes and data across jurisdictions and domains, with limited or no interoperability between stakeholders. Therefore, it is increasingly essential that the characterisation of medicinal products in MPDs can benefit from the global, unique identification of medicinal products.

For this global, unique identification of medicines, ISO developed five standards called identification of medicinal products (IDMP). Three of these describe the identification of substances, at an abstract level of substance(s)/dose form/strength, and of the medicinal products. The European H2020 UNICOM project is implementing the IDMP standards through different work packages, and work package nine is working on implementing IDMP in MPDs.

Objectives: The primary purpose of UNICOM Work Package 9 is to support the implementation of IDMP information into in MPDs so that the users of MPDs can benefit from trusted data describing these products

Methods: To support this implementation, a guideline has been developed which describes the different aspects of integrating IDMP data in an MPD. Aspects addressed are the use cases, other scenarios for integrating IDMP data in an MPD, and specific attention points like system maintenance.

Results: The result is a clear guideline for MPD developers that guides how to incorporate IDMP data in the national or local MPD. The final result is that any national MPD and its users will benefit from trusted definitive descriptive data for their medicines.

Conclusions: MPDs are essential in supporting all medication-related processes in healthcare. As the international standards for identifying medicines become implemented, this will improve the quality and efficiency of MPD production processes. Implementing the IDMP standards in an existing MPD is a considerable task; guidance is necessary.

Health information communication technology evaluation frameworks for prescribing pharmacists

Ayomide Ogundipe *, Tin Fei Sim, Lynne Emmerton

Curtin Medical School, Curtin Perth, Australia

** ayomide.ogundipe@postgrad.curtin.edu.au*

Introduction: Information communication technology (ICT) is instrumental in pharmacists' current practice and emerging roles. One such function is prescribing, which requires using clinical guidelines and documentation of decision-making, commonly via ICT. Development and refinement of ICT should be guided by evaluation frameworks that describe or measure features of ICT and its implementation. In the context of pharmacist prescribing, these evaluation frameworks should be specific to health stakeholders and the pharmacy setting. Contemporary pharmacy practice relies on functional, effective, and efficient technology. Older technologies can still contribute significantly to the technical operation of pharmacy systems. Health information communication technology (ICT) can increase clinicians' access to evidence-based information and enable decision-making, ultimately advancing medical and health service provision and promoting effective, efficient, high-quality healthcare delivery.

Objectives: Given the evolution of pharmacy practice in Australia into new and emerging roles for pharmacists and the lack of relevant evaluation frameworks of health ICT to enable current and future prescribing, this research aims to explore and review existing health ICT evaluation frameworks in health-related literature, and identify frameworks relevant to the development, implementation, and evaluation of pharmacist prescribing.

Methods: A database search of CINAHL, Cochrane Library, EMBASE, Medline (Ovid), ProQuest, Scopus, Web of science, and grey literature was conducted, using combinations of keywords relating to 'ICT,' 'utilisation,' 'usability,' and 'evaluation framework.' Abstracts and titles were screened according to inclusion criteria, and identified evaluation frameworks were critiqued for relevance to pharmacy practice.

Results: A total of 22 articles describing developing and applying 20 evaluation frameworks were identified. None of the frameworks was explicitly developed for pharmacy practice. The technology acceptance model (TAM) is the most widely utilised framework, expressing use behaviour, behaviour intention, perceived usefulness, and perceived ease of use. The Information system success (ISS) and Human-organisation and technology Fit (HOT-fit) are notable evaluation frameworks that address user and organisational influences in health ICT utility. Factors of both can handle the limitation of TAM.

Conclusions: There are currently no health ICT evaluation frameworks in the literature applied to pharmacy practice. We call for a novel framework to evaluate health ICT relevant to emerging roles of pharmacists, such as prescribing. Health ICT evaluation must be applied throughout the life cycle of the technology, ensuring that it remains adaptable and agile. Health ICT evaluation can effectively identify system weaknesses, mitigate risk and implementation issues, and ensure the system meets user requirements.

The paucity of reference to ICT evaluation frameworks in pharmacy practice research may be due to the complex nature of the pharmacy settings, the heterogenicity of technology terms and systems, and the intricate nature of existing ICT systems. While the TAM appears useful for evaluating user attitudes and intentions towards ICT, its relevance to ICT in contemporary community pharmacy practice requires exploration.

Challenging in Maintaining CPDs during the Covid-19 Pandemic: The Indonesian Pharmacists Association Experience

Hilwan Teruna[1,2], Nurul Falah Eddy Pariang[1], Noffendri Roestam[1], Fauzan Zein Muttaqin[1,3], Rudi Hendra[1,2], Agus Sulaeman[1,4], Catleya Febrinella[1]

[1] The Indonesian Pharmacists Association, Indonesia

[2]Department of Chemistry, Faculty of Mathematics and Natural Science, Universitas Riau, Indonesia

[3]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Bhakti Kencana University, Indonesia

[4]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Bhakti Kencana University

** hilwan@iai.id*

Introduction: The covid-19 pandemic has been detected since March 2nd in Indonesia, and the disease has affected how people interact. The Indonesian Pharmacists Association (IPA) has initiated virtual seminars (webinars) for delivering continuous professional developments (CPDs) since the beginning of the pandemic to maintain the competencies of its members with current knowledge. This activity was managed by an information system called SIAp.

Objectives: This study is to share the experience of IPA in maintaining the CPDs for its members during the covid-19 pandemic.

Methods: This descriptive study collects data from webinars conducted in 2020 and 2021.

Results: The participants of these webinars were from all over Indonesia. There were 67 times webinars in 2020 and 48 times in 2021. The attendees of each webinar varied between 332 to 2231 in 2020 and 1153 in 2048—topics for the webinar predominantly clinical aspects in pharmaceutical care. Pre- and post-tests of each webinar were recorded and analysed. The results showed a significant increase in the knowledge of the participants. Other aspects will be discussed further.

Conclusions:: Virtual seminars (webinars) have positively impacted the knowledge of the IPA members. In addition, these webinars can be attended by many participants with a wide coverage area.

Development of medication management resources for caregivers, patients, and volunteers in Singapore

Ying Zhou Soo *, Siew Ann Lee

Ministry of Health, Singapore

** soo_ying_zhou@moh.gov.sg*

Introduction: Singapore's healthcare system faces many long-term challenges. With an ageing population and rising chronic disease incidence, healthcare needs will increase in demand and complexity. Coupled with a shrinking workforce and rising healthcare costs, there is a need to transform the delivery of pharmaceutical care in Singapore. The National Pharmacy Strategy (NPS) is a 10-year plan developed to address these challenges and explore new opportunities to future-ready our pharmacy landscape. It is closely aligned with the Ministry of Health's (MOH) fundamental strategic healthcare shifts Beyond Hospital to Community, Beyond Quality to Value, and Beyond Healthcare to Health. Empowering individuals to get the best out of their medications and achieve desired health goals is central to the NPS.

Objectives: Know Your Meds is a collection of self-help resources on essential medication management developed under the NPS. It is targeted at caregivers, patients, and volunteers, to enhance their medication literacy and empower them with critical skills to help themselves and others manage their medications independently at home. The pilot was conducted to determine the usefulness and relevance of these materials from the public's perspective.

Methods: Know Your Meds content is based on common inquiries about medication management from caregivers, patients, and volunteers. The first series aims to educate viewers on the importance of reading medication labels and how to use the information on them. It was reviewed by the Pharmaceutical Society of Singapore Public Education chapter for content accuracy and health literacy. Key learning concepts were delivered in bite sizes through

engaging conversations in plain language between a layperson and a pharmacist to facilitate the viewers' understanding. The prototype English language video was presented to a live webinar audience of approximately 500 Agency of Integrated Care (AIC) Silver Generation Ambassadors (SGAs), to understand better the public's learning needs to collect feedback for content improvement. Attendees completed a post-session survey at the end of the webinar.

Results: Amongst 143 survey responses from the SGAs, 60.8% feedback that the information shared was new to them, and 97.2% found it helpful. Attendees commended that it was beneficial that the material covered different components of the medication label comprehensively. There were 98% of respondents expressed an interest in learning more about medication management. Future topics requested include packing and storing medications, managing drug allergies and side-effects, and common conditions in seniors.

Conclusions: The findings demonstrate that the materials presented useful information that was easily understood by the public. There is a demand for resources on medication management among caregivers, patients, and volunteers in Singapore. Future series will be developed in line with this feedback to ensure the delivery of high-quality content that is useful and relatable to the public. Know Your Meds resources can also be a valuable addition to the healthcare professionals' toolkit, to activate and empower their patients to manage their medications. These resources have been published on the MOH website (www.moh.gov.sg/knowyourmeds), and will be shared across other online platforms, such as the HealthHub and AIC Resource Library, for greater public adoption. Materials will also be translated into vernacular languages to promote accessibility to a larger audience.

A study on the incidence of Cisplatin-induced nephrotoxicity in the adult population

Kirubakaran J John*, Fahmida Khatoon, BVB Balaji

Vikas Institute of Pharmaceutical Sciences Rajahmundry, India

**john.mpharm@gmail.com*

Introduction: Cisplatin is a chemotherapeutic agent often used in clinical care; however, it can cause nephrotoxicity if taken frequently. Nephrotoxicity is temporary and dose-dependent; it can decrease the glomerular filtration rate (GFR), which can be clinically evaluated from increased serum creatinine and decreased creatinine clearance.

Objectives: Considering nephrotoxicity as a significant side effect of cisplatin, this study aims to understand the incidence of cisplatin-induced nephrotoxicity with cumulative dose.

Methods: The study used a retrospective analysis with a sample size of 100 to investigate the nephrotoxicity of patients using Cisplatin. The study was conducted in Surya Global multi-specialty hospital, Kakinada, Andhra Pradesh, India. Patients aged < 65 years were included with weekly cisplatin chemotherapy. Changes in blood urea, serum creatinine, and creatinine clearance were noted.

Results: In the study, the majority were females constituting 76.8%, and the males constituting 23.2%. There was a significant difference between the base chemo and third cycles (p<0.01). There was a significant difference in mean creatinine clearance for age (n=60). (t2.821 =21.197, p < .01). The average mean difference in creatinine clearance was 7.59 (8), which was lesser when compared to patients whose age was less than 60—blood urea before versus creatinine. The first cycle with cumulative doses (200,250, and 300) showed a significant difference, showing that cumulative doses in different cycles made a considerable difference.

Conclusions: When a general linear model with pair-wise comparisons for creatinine clearance and different chemotherapy cycles was employed, it revealed that the significant value of 0.0005 is smaller than the p-value, indicating that the first and third chemotherapy cycles are substantial, and the other value is 0.019, meaning that the third and fifth cycles are significant.

Detection and evaluation of vaccine fake news from Romanian Tweets

Andrei Valeanu*, Cristian Daniel Marineci, Dragos Paul Mihai, Corina Andrei, Ciprian Puscasu, Alexandra Mihaela Ionica, Ema Bulancea, Valentina Patricia Predoi, Miruna Ioana Hinoveanu, Simona Negres

Carol Davila University of Medicine and Pharmacy, Faculty of Pharmacy, Romania

** andrei_valeanu@yahoo.com*

Introduction: During the Covid-19 pandemic, online misinformation has already negatively impacted the trust of specific population segments in vaccine efficacy and safety. This has been hypothesised to lower vaccination rates, especially in Eastern Europe. Regarding the spread of vaccine fake news, Twitter is one of the most important social media platforms used for such purposes.

Objectives:: Despite several works that analysed vaccine tweets written in English, no study has been conducted to identify and evaluate vaccine fake news from Romanian tweets. Therefore, the objectives of the current study were

the detection and analysis of a relevant batch of tweets related to vaccines written in Romanian and to build of a machine learning algorithm based on artificial neural networks to classify future tweets automatically.

Methods: A total of 1300 tweets written in Romanian (original tweets and replies) were collected from four relevant periods within the Covid-19 pandemic. The tweets were manually grouped into three main classes: true information (whether scientific information or general accurate news related to vaccines or Covid-19 Romanian vaccination campaign), neutral information (such as available, ironical, or irrelevant comments related to vaccines), and fake (or manipulative) information. The manually classified dataset was analysed by correlation analysis (to identify specific relationships between the three classes and tweet engagement metrics, quantified through the Spearman correlation coefficient) and developing a machine learning algorithm using natural language processing techniques. The machine learning algorithm was evaluated based on its ability to estimate the probability that a specific tweet is authentic, neutral, or fake. The data analysis was undertaken in python programming language, version 3.9.2.

Results: The correlation analysis yielded moderate but statistically significant relationships (p<0.05) between the tweet manual classification and the engagement metrics: on average, the tweets classified as fake news showed more engagement in terms of several likes (r=0.287), replies (r=0.203) and retweets (r=0.195) as compared to the neutral and true ones. The posts labelled misinformation also showed specific word patterns compared to the other tweet categories. The cross-validation of the machine learning algorithm resulted in an 84.13% Area Under the receiver operating characteristic curve (ROC AUC) score, which was considered good given the number of extracted tweets and high variability in terms of language style.

Conclusions: The current work has the potential to bring new insights regarding the characteristics and detection of vaccine fake news written in Eastern European languages and distributed through social media platforms. Future studies must aim to enlarge the number of analysed tweets and develop an online platform to raise awareness and aid in detecting fake or manipulative vaccine information early.

Improving oral drug administration in patients with swallowing problems and feeding tubes

Astrid Annaciri-Donkers*, Shi Ng

Royal Dutch Pharmacists Association (KNMP), The Hague, Netherlands

**a.annaciri-donkers@knmp.nl*

Introduction: Correct administration of oral drugs in patients with swallowing problems and feeding tubes remains challenging. Information regarding this route of administration is very scarce and associated with reduced efficacy, increased toxicity, and increased risk of tube obstruction due to an inadequate administration method.

Objectives: Improve medication safety by developing a database on safe drug administration in patients with swallowing problems and feeding tubes.

Methods: A working group of community and hospital pharmacists, a pharmacy assistant, a nurse, and a dietician identified the issues and specific needs when administering oral drugs in patients with swallowing problems and feeding tubes. It was also identified the most commonly used drugs in the Netherlands are among the general population, children, and older people. A format for a drug monograph was developed, containing information on the identified issues and specific needs for the most commonly used drugs. The content of the individual monographs is based on available product information, information supplied by drug companies, scientific publications, and practical research.

Results: A database (www.oralia.nl)with monographs on 600 oral drugs containing practical advice and recommendations for safe drug administration in patients with swallowing problems and feeding tubes. The monographs also have available alternate routes and medicines.

Conclusions: The developed database provides appropriate drug information, practical advice, and recommendations for healthcare professionals like pharmacists and nurses. This can help to prevent or reduce medication errors and improve medication safety.

A systematic review and thematic synthesis: exploring health information exchange between community pharmacists and patients with atopic dermatitis

Abdi Berk Cayci[1,2]*, Adam Pattison Rathbone[1], Laura Lindsey[1]

[1] *Newcastle University, United Kingdom*

[2] *Hacettepe University, Ankara, Turkey*

* *A.B.Cayci2@newcastle.ac.uk*

Introduction: Atopic dermatitis, or atopic eczema, is a chronic condition that can present early and remain long. Regular eczematous lesions identify this disease, mainly localised to the curving surfaces of the patient body, redness of the skin, extremely itchy rash, and disturbance. Although atopic dermatitis is a long-term condition, it can be treated successfully, and getting successful results requires personalised therapy management. Community pharmacists are the first-line health professionals to help patients manage their needs.

Objectives: This systematic review aims to identify what community pharmacists do to manage atopic dermatitis and determine pharmacists' knowledge, attitudes, and opinions about it and its treatment.

Methods: A general literature search was conducted in five databases, including Medline, Embase, CINAHL, PsycINFO, and PubMed. A literature search was conducted between January and February 2022 by one author (ABC) and validated by two other authors (APR, LL). Papers were screened using the eligibility criteria and ensured they were full-text primary research without any language restriction. Data were extracted using a standard data extraction form. Data included any information in the published literature, including text, graphics, and diagrams. Data was transposed to NVivo and synthesised thematically to determine 1) characteristics of studies, 2) descriptive findings, and 3) analytical findings.

Results: 23 studies were included; three used qualitative, 17 used quantitative, and three used mixed methods. Descriptive findings indicate that 21 studies were from high-income countries, and two were from low-middle-income countries. Analytical results showed that community pharmacists did not communicate information in a standardised way with patients. For example, "fingertip unit" was rarely used regarding the application of topical corticosteroids, instead advising patients to "apply it thin and sparingly." Additionally, pharmacists appeared to recommend patients use emollients without assessing the severity or condition of the skin. Information communicated about side effects was limited.

Conclusions: The results highlight that community pharmacists may not effectively communicate information about medicine use with patients, which may contribute to poor treatment adherence and corticosteroid phobia. A limitation of the study is that studies mainly focused on topical corticosteroid use rather than other treatments of atopic dermatitis. In addition, most of the studies were from high-income countries, so the findings may not apply to low-middle-income countries.

Accessibility to community pharmacy in Indonesia: A community pharmacy density mapping using geographical information system

Afina Nur Fauziyyah *, Ian Bates

Research Department of Practice and Policy, School of Pharmacy, University College London, United Kingdom

**afina.fauziyyah.21@ucl.ac.uk*

Introduction: The World Health Organisation (WHO) and World Bank reported that at least half of the world's population cannot access essential health services equally. Pharmacists, as the third largest healthcare workforce, is the most accessible healthcare provider for basic health services and medicines expertise in most countries. Community pharmacies provide the main access point to primary health care, especially for long-term and acute conditions. In Indonesia, the total number of community pharmacies is the highest compared with other healthcare service providers.

Objectives: This study describes the accessibility to community pharmacies in Indonesia.

Methods: Demographic data on the regional population and community pharmacies were obtained from the Indonesian central agency on Statistics, the national professional leadership body for Pharmacy (IAI), and the Ministry of Health of Indonesia. To evaluate population accessibility to community pharmacies, we standardised the data by determining the community pharmacy density per 10,000 population. The results were mapped using geographical information system (GIS) to represent the relational density of community pharmacies of each province in Indonesia.

Results: Of all the 34 regional provinces in Indonesia, the total number of community pharmacies was 30,199. The sample mean was 1.21 or 1 community pharmacy per 10,000 population. A total of 18 out of the 34 provinces (53%) were less than the sample mean. There is considerable variance in community pharmacy density in Indonesia, with the highest density of 2.05 in Bali province and the lowest density of 0.57 in Central Kalimantan province.

Conclusions: Community pharmacy density varies between provinces in Indonesia, which indicates unequal access to community pharmacy services. Future research is needed to identify the strategies to provide equal access to pharmacy services, including the possibility of telepharmacy provision by community pharmacies.

COVID-19 vaccine data collection, analysis, and visualisation to support informed decision-making in Africa

Ezinne V.C Onwuekwe*

Africa Centres for Disease Control and Prevention

** ezinnevc@gmail.com*

Background: From early 2021, vaccination had been added to the global COVID-19 response package. Africa's largest-ever immunisation drive is underway, with COVID-19 vaccines being administered in all African countries. Starting with Seychelles on January 10, 2021, 44 out of the 55 member states commenced vaccinating against COVID-19, with nine vaccines being utilised. As countries began the deployment of COVID-19 vaccines, the need to design and implement monitoring systems that collect, analyse, and visualise COVID-19 data to measure the effectiveness of the vaccination programme and for decision-making was identified. This system tracks vaccine supply, uptake, and coverage among the overall population and the most at-risk population prioritised for vaccination.

Objectives: In this paper, using Africa Centres for Diseases Control and Prevention (Africa CDC) as a case study, the authors described the collection and analysis process of COVID-19 vaccine data, which monitors progress and gaps in the continental vaccine programme roll-out to inform decision-making. They highlighted the challenges and proposed opportunities to address the latter in the current and future pandemics.

Methods: This qualitative research was informed by individual key informant interviews with the five COVID-19 vaccine data analytics team members using open-ended questions. These were recorded and transcribed. Then, an in-depth review of the guidelines and protocols was done to catalogue methods and processes used for data management.

Results: As part of the outbreak response, the data management team provided technical support in tracking data on COVID-19 vaccine delivery and uptake on the continent, which is reflected in a regularly updated dashboard. In addressing these data needs, they played a valuable role in enhancing the quality and use of data for evidence-based planning and decision-making. Policymakers better understand the rate of current vaccine rollout and the potential impact of vaccinations on pandemic outcomes such as transmission, morbidity, and mortality. The information produced has been instrumental in informing decisions of urgent support by the Africa CDC, saving lives, and livelihood programmes. It has been presented in high-level meetings with partners and Member States to guide the COVID-19 response.

Conclusions: The dashboard developed, post data collection and analysis, visualised COVID-19 vaccine data for ease of understanding by decision-makers. Such readily accessible information can help shorten and guide decision-making time, strengthening global health security as we track vaccination efforts in response to the COVID-19 pandemic. Such systems should be reproduced in the African Member States to ensure that decisions related to Covid-19 vaccinations are evidence-based. This also creates a continental network of data systems that speak to each other. However, access to timely and complete data remains a challenge.

Influence of the pandemic situation caused by COVID-19 on the dispensing of multi-compartment compliance AIDS in Bizkaia

Señora Marta Pérez-Gómez Moreta[1]*, Cristina Bruzos-Cidón[2], Iker Francisco Altamira[1], Amaia Martinez Viteri[1], Natalia Burgos-Alonso[1]

[1]Department of Preventive Medicine and Public Health. Faculty of Medicine and Nursing. UPV/EHU., Spain

[2]Department of Nursing I. Faculty of Medicine and Nursing. UPV/EHU., Leioa, Spain

**marta.pg4@gmail.com*

Introduction: Longer life expectancy has led to an ageing population with many chronic pathologies and poly medications (with five or more drugs in treatment). Lack of adherence to pharmacological therapy in elderly patients is a constant and widely recognised health problem. In 2009, the Basque Government, together with the official College of Pharmacists of Bizkaia and the home help services (HHS), committed and continue to commit to the multi-compartment compliance aids (MCA) as a tool to improve the adherence of these patients by subsidising the service for people who have home help. In the Basque Country, the primary health areas are distributed in integrated health organisations (IHO), combining the hospital, the primary care centres, the HHS and the pharmacies in the same health area. The SARS-CoV-2 pandemic has not only affected the most vulnerable patients with a higher rate of contagion but also with a decrease in services and access to them.

Methods: To describe the evolution of the multi-compartment compliance aids in Bizkaia between 2009 and 2020 to assess the pandemic's influence on its dispensation. A retrospective descriptive study of the use of the MCA in patients assigned to the HHS by IHO in the province of Bizkaia. Data were processed with Microsoft Excel and SPSS.

Results: Of the 1906 patients registered with the MCA during the study period, 66% were women, and 34% were men. From 2014 onwards, women over 80 most demanded the service in all the IHO, with the OSI Bilbao-Basurto being the IHO with the highest proportional demand for this service. The need for MCA increased gradually until 2019; in 2020, this demand decreased, although the proportionality was maintained in all fields of study. Women have the highest number of medicines, 9.7, compared to an average of 7.4 for men. It should be noted that the Barakaldo-Sestao and Uribe IHO have the lowest demand for the service, but the ones whose patients take the most medication. The main problem related to medicines for requesting the MCA service is therapeutic non-compliance (93.4%), followed by personal characteristics and duplications (2.7% and 1.4%).

Conclusions: The pandemic has decreased services and access to services for older people. In the case of the MCA, inclusion in the service has been reduced in patients over 65 and on multiple medications but not in patients under 65. The demand has been proportional to the evolution presented since 2014. Women over 80, with an average treatment non-compliance of 9.7 medicines, from the Bilbao-Basurto IHO have continued to demand the most service. However, in 2020 this demand decreased significantly.

Teaching pharmacy students how to support patients who struggle to swallow solid oral dosage forms (SODFs)

Alice McCloskey[1]*, Michael Traynor[1], Andrew Lunn[2], Emma Lim[3], Yincent Tse[3],Nicola Vasey[3], Laura Lindsey[4], Adam Rathbone[4]*

[1]*Liverpool John Moores University School of Pharmacy and Biomolecular Sciences, United Kingdom*

[2]*University of Central Lancashire School of Pharmacy and Biomedical Sciences, United Kingdom*

[3] *The Great North Children's Hospital Newcastle upon Tyne Hospitals NHS Foundation Trust, United Kingdom*

[4] *Newcastle University, School of Pharmacy, Faculty of Medical Sciences, United Kingdom*

** a.p.mccloskey@ljmu.ac.uk*

Background: Up to 50% of adults struggle to swallow solid oral dosage forms (SODFs) due to 'pill aversion'- a fear of taking SODFs, rather than underlying physiological issues, e.g., dysphagia. The literature suggests this may be due to a lack of knowledge about effective pill-swallowing techniques, previous poor medication-taking experiences, or formulation-specific characteristics, e.g., uncoated or large SODFs. Typically, healthcare professionals do not enquire about pill aversion, leaving it unnoticed and potentially contributing to poor medication adherence and patient health outcomes. Studies have shown that pill aversion can be overcome with pill-swallowing training delivered by healthcare professionals. However, little is known about how healthcare professionals learn to support patients, both children and adults, who struggle to swallow SODFs. "KidzMed" is a virtual eLearning educational intervention to teach healthcare students and professionals how to train people to swallow SODFs and overcome pill aversion.

Objectives:

- Explore student pharmacists' own experiences of pill swallowing.
- Determine student pharmacists' views of the KidzMed eLearning programme.
- Evaluate the utility of the KidzMed eLearning programme in pharmacy education.

Methods: Student pharmacists were recruited via email at three universities delivering MPharm degrees in the United Kingdom (UK) between September and December 2021. Participation was voluntary as part of a self-directed learning module in a virtual learning environment (Canvas). Questionnaires were prepared using Microsoft Forms to collect pre and post-learning data. The PILL-5 screening tool was included in the pre-learning questionnaire to explore students' experiences of pill swallowing. Participants accessed the questionnaires and eLearning at their convenience. Data was exported from Microsoft Forms to Excel, and simple statistics were performed, including totals and percentages, and a word cloud was generated to summarise free text comments.

Results: A total of 113 student pharmacists completed the pre-learning questionnaire. Of these, most (77%, n=87) were women and in their third year of the four-year MPharm degree (56.6%, n=64). The PILL-5 screening tool highlighted that 42.5% (n=48) of participants had difficulty swallowing SODFs sometimes or always. Reflections on the curriculum studied to date indicated that this was the first time many were exposed to educational material relating to difficulties swallowing SODFs. Post-learning data showed a very positive response to eLearning. After completing the learning, participants felt comfortable teaching patients to take SODFs (95% n=62), and 99% (n=64) agreed it was a helpful learning skill. Participants responded positively to the KidzMed eLearning resource, reporting it as functional, quick and interactive.

Conclusion: This study is the first example of implementing KidzMed eLearning resources in UK Schools of Pharmacy. It

provided students with a novel learning opportunity, highlighting the need to include counselling on SODF swallowing during undergraduate pharmacy education. KidzMed eLearning has the potential to enhance pharmacy practice, preparing pharmacy students to support patients and improving medication use and adherence. As only a small sample size was obtained, further statistical analysis to evaluate learning outcomes was not possible, so additional work is needed to explore the generalisability of these findings.

BOT PLUS 2022 – New feature

Antonio Blanes Jiménez, Tomás Bobillo de Lucas Pinto, Tamara Dorado Romero, Iván Alejandro Espada Ibáñez*, Cristina Fernández Marcos, Carlos Fernández Moriano, Paula Mateos Sánchez, Pilar Zandueta Llorente

General Pharmaceutical Council of Spain, Spain

** ivanespada@redfarma.org*

Introduction: BOT PLUS is the medicines and over-the-counter database of the General Pharmaceutical Council of Spain (CGCOF) with complete information on more than 25.000 medicines for human use, 18.000 veterinary medication, and 50,000 over-the-counter products. BOT PLUS is currently integrated into the software of more than 19,000 Spanish pharmacies. It is constantly evolving to adapt to the needs of pharmacists, providing access to first-hand official information on medicines and facilitating dispensing and invoicing of tasks.

Objectives: In 2022, CGCOF launched a new version of BOT PLUS, which includes significant new features to improve care and technical support for medicines and over-the-counter product dispensing, aiming to provide unique solutions to facilitate the pharmacist's daily professional practice.

Methods: The different claims raised by the Pharmacy Chambers and the users themselves attending other BOT PLUS workshops and distance courses held over the last few years, surveys conducted among users, and proposals made by the different CGCOF working groups were evaluated. Likewise, the features of other web pages were analysed to upgrade the tool's usability and make it more intuitive.

Results: BOT PLUS has been redesigned in line with the new corporate image of the General Pharmaceutical Council of Spain, making it more compatible with current electronic devices, with a fully responsive design, which makes it easier to consult on any electronic device. Likewise, a series of changes were created to the features of BOT PLUS to simplify the use of the tool's search engines, making it more intuitive and easier to use and therefore increasing its use by the user.

Conclusions: This information is encoded and integrated into pharmacy management programmes, allowing pharmacists rapid access and better healthcare for our patients. BOT PLUS continues to evolve to help pharmacists exercise their healthcare work.

BOT PLUS lite: Accessible information on medicines

Antonio Blanes Jiménez, Tomás Bobillo de Lucas Pinto, Tamara Dorado Romero, Iván Alejandro Espada Ibáñez*, Cristina Fernández Marcos, Carlos Fernández Moriano, Paula Mateos Sánchez, Pilar Zandueta Llorente

General Pharmaceutical Council of Spain, Spain

** ivanespada@redfarma.org*

Introduction: In response to society's increasing demand for accurate and precise information about medicines, the General Pharmaceutical Council of Spain has developed BOT PLUS lite. BOT PLUS lite is an online database aimed at the general public, including pharmacological and administrative information on all medicines authorised in Spain, aiming to contribute to better knowledge and rational use of drugs.

Objectives: To make truthful, objective, independent, and accessible information on medicines available to the public, contributing to the rational use of drugs and allowing users to access information on medicines adapted to a language easily understood by all types of people.

Methods: BOT PLUS lite is available to users from the CGCOF website Farmaceuticos.com. A powerful search engine has been developed, allowing users to find a specific medicine by searching for its name, composition, or laboratory. The information in BOT PLUS lite comes from BOT PLUS, our medicines database and its content has been adapted to be easily understood by the general public.

Results: BOT PLUS lite contains information on more than 25,000 medicines, 2,000 active ingredients, and 500 laboratories. It provides information on the composition, dispensing conditions, storage conditions, rules for correct administration, interactions, and adverse medicines reactions. It also offers video tips related to different medicines and descriptive pictograms that provide information on doping, the presence of certain excipients, or the safety of use in children, breastfeeding women, or pregnant women. In addition, materials from the Spanish Agency of Medicines and medical devices (AEMPS), such as the package leaflet, the technical data sheet, or images of the packaging, are provided.

Conclusions: BOT PLUS lite provides access to a reliable, up-to-date, and readily understandable source of information on medicines for the entire population. It allows users to quickly access information tailored to their needs, with the ability to customise the consultation profile according to the characteristics of each patient using a simple search engine.

General Pharmaceutical Council of Spain's response against COVID-19

Antonio Blanes Jiménez*, Tamara Dorado Romero, Iván Alejandro Espada Ibáñez, Cristina Fernández Marcos, Carlos Fernández Moriano, Paula Mateos Sánchez

General Pharmaceutical Council of Spain

** ivanespada@redfarma.org*

Introduction: In the wake of the pandemic caused by the SARS-CoV-2 virus, a health crisis arose in which all healthcare collectives set up information mechanisms aimed at their professionals and the general public. The General Pharmaceutical Council of Spain carried out a series of actions to improve awareness of the pandemic.

Objectives: To support pharmacists as care providers and ensure patient health education.

Methods: The General Pharmaceutical Council of Spain set up a specific information centre on COVID-19, aiming to centralise the informative actions carried out in this area, such as the immediate resolution of queries to professionals and the public, the publication of technical reports, the creation of an informative website, sending official communications and the production of informative videos and other multimedia materials.

Results: Since the beginning of the COVID pandemic, 2,086 queries have been received from the Provincial Pharmacy Chambers, registered pharmacists, other healthcare professionals, and the general public. The most frequently consulted topics were the dispensing and regulating self-diagnosis tests and the different types of protective masks. In addition, 389 communications were sent to the Provincial Pharmacy Chambers related to COVID-19: prevention and control strategies published by health authorities, information on dispensing medical devices to diagnose and prevent the virus, and other technical-professional documents. Finally, more than 8,000 visits to the specific COVID website were registered.

Conclusions: The General Pharmaceutical Council of Spain is a crucial reference point for information on managing the health crisis caused by the SARS-CoV-2 virus. Implementing a hotline to receive queries, as well as the publication of video tips, infographics, and other materials, enables information to be adapted to the demands of health professionals and citizens.

Concise medicine information improves health literacy and therapy compliance among patients with low health literacy

Scott Bradley Patton Wishaw *, Nike Everaarts - De Gruyter

Royal Dutch Pharmacists Association, The Hague, Netherlands

** s.wishaw@knmp.nl*

Introduction: Patients with low health literacy often have problems comprehending the medication package leaflet. To improve understanding and therapy compliance, there is a need for simplified, concise, and easily accessible information during consultation at the pharmacy, the doctor's office, in the hospital, or at home.

Objectives: To create simplified, concise information to be used alongside consultation and the medication package leaflet and to dispense this information through the public health website (www.apotheek.nl) and Dutch pharmacy information systems.

Methods: The authors identified that the most prescribed and used medicines and created information in the Netherlands on a B1 language level are tailored towards the drug and dosage form. Prototypes were tested among patients with low health literacy. The concise medicine information will be implemented in Dutch pharmacy information systems and via our public health website.

Results: Prototypes enhanced with symbols and a graphic layout reinforced essential information for patients with low health literacy and improved understanding of the most critical aspects of pharmacological treatment. In addition, a QR code encourages users to navigate to more information in a video format. A total of 10 prototypes were made. The authors also identified a subset of 50 medicines to service over 50% of first-time medicine users and another 50 to service over 75% of first-time medicine users. Through an iterative process, we aim to expand coverage to over 90% of first-time medicine users. In addition, availability via (www.apotheek.nl) is being developed alongside integration through pharmacy information systems to support the prescription and consultation process.

Conclusions: Presenting medical information in a concise, visually appealing format can improve patients' health literacy and therapy compliance, especially those with low health literacy. Therapy compliance and patient understanding can be reinforced by integrating concise, simplified information into the consultation process.

National drug formulary: A Singapore-specific, authoritative, and national reference base

Rajalakshmi Rajaram*, Imelda Halim, Goh Wan Lin

Ministry of Health, Singapore

**rajalakshmi_rajaram@moh.gov.sg*

Introduction: Local healthcare professionals (HCPs) use multiple sources of information in their practices, and there is currently no single integrated directory for local clinical and drug-related information in Singapore. This poses challenges in the transition of patient care across settings as existing drug information sources may not be consistent or tailored to reflect the local healthcare context.

Objectives: The National Drug Formulary (NDF) initiative aims to establish a Singapore-specific, authoritative, and national reference base to guide evidence-based best practices for medication prescribing, dispensing, administration, and monitoring by consolidating clinical and drug-related information. NDF can also promote patient education and empowerment, encouraging Singaporeans to take some ownership of their healthcare.

Methods: NDF is a publicly accessible, one-stop website that concisely summarises consolidated drug and clinical information for drugs registered as therapeutic products with the health sciences authority in Singapore and products subsidised by the Ministry of Health and medicines approved for inclusion under the rare disease fund. Information such as subsidy information, local drug guidance, and their general availability in Public Healthcare Institutions (PHIs) will be available on NDF. This improves accessibility to relevant and localised information for local HCPs, improving the smooth transition of care when patients move across care settings and providers. This mobile-friendly website is targeted to be launched by Q2 2022 and will be updated monthly.

Results: As the NDF website is designed to be user-friendly, it features search modalities with predictive text and filter functions to facilitate the search process and improve user experience. It also boasts a 'Drug Comparison' function allowing users to view general drug information of 2 different active ingredients in a single view.

Conclusion: By providing up-to-date drug and localised clinical information via a single source, the NDF will complement the existing initiatives of drug guidance and appropriate care guides to influence the proper use of drugs in Singapore. NDF will facilitate HCPs' access to relevant and localised information to make better-informed decisions confidently enabled by evidence-based best practices and value-added data, thus helping in the smooth transition of care. Patients will also be more empowered with knowledge of the drugs that they are prescribed as part of their care journey.

Educational outreach visits as a strategy to increase knowledge of essential medicines lists

Fernanda Machado*, Vanessa Gervasio, Brunna Cordeiro, Renato Cruz, Danielle Santos

Federal University of Rio de Janeiro, Brazil

** flacerdas@gmail.com*

Introduction: Access to medicines is vital to ensure universal health coverage. In Brazil, the medicines policy established the National essential medicines list as a reference for health secretaries to manage the pharmaceutical services under their jurisdictions. Municipalities are responsible for primary care in the public health sector, including the selection of medicines to attend to the health priorities of their citizens, resulting in the municipal essential medicines List (MEML). However, adherence to MEML is considered suboptimal, which could be attributed to a lack of information and inadequate sensitisation of health workers.

Objectives: To describe educational outreach visits to improve knowledge of MEML in a municipality of southeast Brazil.

Methods: Educational visits based on the principles of educational outreach, also known as academic detailing, and the development of printed educational materials were adopted. The visits were conducted by trained undergraduate pharmacy students with the assistance of a pharmacist. The visits were scheduled with the health units' coordinators prioritising prescribers' time availability. During the visits, the importance of MEML was briefly discussed and printed educational materials with the MEML were distributed for consultation. At the end, participants could fill in an opinion survey.

Results: The visits were held from June 2017 to December 2019 in 47 health units, including primary, secondary, and tertiary healthcare facilities. 74 doctors and 50 nurses joined the educational visits and distributed 189 posters and 227 brochures. Before the intervention, only two health units had MEML available for consultation. In addition to the information about the MEML, the visits allowed pharmacy students to answer questions about related topics such as drug shortages and legislation. Of the 29 health workers who evaluated the visits, 96% were very satisfied with the approach and two mentioned the relevance of the initiative for the population.

Conclusions: Health professionals in the municipality were not fully informed about the organisation of pharmaceutical

services and the medicines available for users of the public health system. The study revealed that educational outreach visit is a promising strategy for informing about drug access in Brazil's public health system.

Treating Huntingtin's disease using CRISPR/Cas9 Gene editing: Designing multiple sgRNA using In-silico tools

Sai Chaitanya R G*, Geetha Karra

CMR College Of Pharmacy, Hyderabad, India

**drmelnaem@gmail.com*

Introduction: CRISPR/Cas9 (Clustered regularly Interspaced short palindromic repeats/ CRISPR-associated endonucleases) is naturally a defence mechanism of bacteria against bacteriophages. It is a simple yet potential tool of biotechnology in gene editing. Recently, researchers have been inclined toward this tool as it has more potential for applications like gene therapy and personalised medicines. This work is essential as the technology is in the initial stage of applications, and this research gives a head start for studying more about genetic diseases and their treatment.

Objectives: This study aimed to design multiple sgRNAs with overlapping sequences for CRISPR/Cas9 gene knockout for the HTT gene(causing Huntington's disease). After the double-strand break by Cas9 DNA repair process through the non-homologous end joining (NHEJ) pathway is much more error-prone.

Methods: Computational tools were used to identify possible gRNA sequences. This study is centric on designing multiple sgRNAs through In-silico methods. Out of possible gRNAs, required gRNA sequences were shortlisted with early coding regions, sharing common exon, having minimum off-targets, and having high activity.

Results: The research has shown four suitable gRNAs creating Double-stranded break(DSB) at locations - 3,116,100; 3,116,085; 3,116,102; 3,116,121 on chromosome four having HTT gene.

Conclusions: This research has found suitable gRNAs for further CRISPR/Cas9 Gene KO experiments. This In-silico research is the first step before conducting an Ex-vivo or In-vivo CRISPR/Cas9 experiment. This research can be the pioneering research in gene therapy and applying CRISPR/Cas9 technology in treating genetic diseases.

The appropriateness of secondary medicine packaging for people with visual impairment

Marlita Ekasari[1,2]*,Chris Dickinson[2], Denham Phipps[2]

[1]Faculty of Pharmacy, Universitas Gadjah Mada, Indonesia

[2]Division of Pharmacy and Optometry, School of Health Sciences, Faculty of Biology, Medicine, and Health, University of Manchester, United Kingdom

** marlita.putri.ekasari@ugm.ac.id*

Introduction: Medicine labelling is crucial to ensure patients use medicine safely. The best practice on labelling from the United Kingdom (UK) is described in a guide issued by the National patient safety agency (NPSA) 2007. They recommend a designated space for attaching prescription medication labels on the secondary medicine packaging. This space could be used for a label design in an accessible format for patients with visual impairment.

Methods: An observational study was conducted to investigate the potential space for medication labels. A total of 60 samples of antihypertension secondary medicine packaging were evaluated and compared to NPSA guidelines.

Results: The key finding from this study is that not all medication labels follow the NPSA 2007 guide on label space. Only 23.33% had the space of the required size, and 61.67% had a space without a barcode. The space should be oriented such that the text direction on the label is the same as on the packaging, which happens in about half the sample (53.33%). On average, the potential space for the drug prescription medication label on the antihypertension drug (n=58) is 5.88 ± 1.34 cm (length) and 3.45 ± 0.33 cm (width). Two secondary-packaging samples did not have any potential space for labels.

Conclusions: These findings can help to inform the design of an accessible medication label based on the available space. Further studies using a broader range of dosage forms and other drug categories must be carried out to shed more light on potentially designing accessible medication labels.

Challenges of the new EU Clinical Trial regulation EU 536/2014

Anja Glušica, Snežana Mugoša*, Jelena Rakočević

Institute For medicines And medical devices Of Montenegro, Montenegro

** snezana.mugosa@cinmed.me*

Introduction: Clinical trials of drugs are essential in the development of new therapeutic solutions, and therefore it is necessary to establish such a regulatory framework which, in addition to promoting the rights and safety of subjects, also stimulates interest in conducting clinical trials. Several initiatives have been taken in response to reducing activities in clinical trials, the most important of which is the introduction of the new EU Clinical Trial Regulation EU 536/2014. Repealing the previous EU Clinical Trial Directive No 2001/20/EC, the new regulation has introduced several changes, among which simplifying the procedure for approving clinical trials, increasing transparency, and improving safety reporting are particularly significant. However, despite the clear advantages, several concerns have emerged regarding various aspects of the new regulation.

Objectives: The research aimed to define potential shortcomings and doubts regarding the provisions of the new regulation.

Methods: The authors used a comparative analysis of legal documents and a review of academic papers.

Results: The data show that one of the potential risks posed by the new regulation is related to increased transparency of data and implies possible endangerment of participants' privacy, errors in interpretation of clinical trial outcomes due to the inadequate performance of data, as well as risk of disclosure of confidential data. In addition, flawed implementation of the provisions has been shown to hamper the recruitment process for respondents and researchers and affect pragmatic clinical trials. However, the division of assessment tasks simplifies the approval procedure, limiting the scope of evaluation of ethics committees only to Part II items represents a potential problem in interpreting the documentation.

Conclusions: Given that the new regulation implies a set of measures that represent a significant step forward in terms of creating a favourable environment for conducting clinical trials, all participants in the system must contribute to the challenge of implementing new provisions so that the result is the harmonisation of trials across Europe as well as fortifying Europe's attractiveness for clinical trials.

COVID-19 setback in the rationalisation of Pharmacotherapy

Jelena Rakočević, Snežana Mugoša*, Anja Glušica

Institute For medicines And medical devices Of Montenegro, Montenegro

** snezana.mugosa@cinmed.me*

Introduction: One of the most important strategies within the health system is the rationalisation of pharmacotherapy.

Objectives: This study presents drug consumption in Montenegro during the COVID-19 pandemic.

Methods: For the preparation of the report, data on the turnover of registered wholesalers that traded in medicines in Montenegro in 2020, as well as in 2021, were used. Our methodology is the same as WHO, ATC / DDD system. All reports are expressed in a defined daily dose (DDD) per 1000 inhabitants per day, as well as financially, and can be divided separately into outpatient and inpatient drug consumption. An analysis was carried out by the Higher Education Institutions (HEIs) and regions of the applications received and the granting of FEFARM scholarships to students in Pharmaceutical Sciences.

Results: When the drug consumption in 2020 was compared with that of 2019, and 2021, the most significant increase was recorded in antiparasitic drugs, insecticides, and insect repellents, which was to be expected given the fact that hydroxychloroquine and chloroquine were initially in the recommendations. However, the drugs most commonly used to treat COVID-19 infections are anti-infective drugs for systemic use, which have risen in recent years.

Conclusions: The significant increase in the use of systemic antibiotics during COVID-19 infection is attributed to the treatment of respiratory diseases. In 2012, measures were taken for the rational use of antibiotics, and decreasing trend until 2017 was recorded; however, in 2017, there was a significant increase in antibiotic consumption, which will continue in 2020 and 2021, respectively. Although the growth of 0.52 and 4.09 seems negligible, it is very substantial and worrying given that in 2011 Montenegro was in second place in terms of antibiotic consumption in Europe.

Sarilumab-associated neutropenia and thrombocytopenia in patients with rheumatic disease

Lorenzo Pérez-periáñez Orrillo*,Víctor Fernández Martínez, David Gómez Gómez,Irene Aragón Gracia, Marina Bàrbara Ramis Barcelò,Rosana Lucía Rey Montalbán, Clara Fernández Martínez, Marta Valero Domínguez

Hospital Universitario Marqués De Valdecilla, Spain

** lorenzo.perezperianez@scsalud.es*

Introduction: Sarilumab is a human monoclonal antibody that specifically binds to interleukin-6 receptors, blocking different cellular responses mediated by this cytokine, such as proliferation, differentiation, and survival in haematopoietic cells.

Objectives: This study aims to analyse the haematological safety profile of sarilumab in the outpatient treatment of rheumatic diseases.

Methods: Observational and retrospective study that included all patients with rheumatic pathologies who started treatment with sarilumab in a tertiary hospital between October 2019 and June 2022. Data were collected from the assisted electronic prescribing programme (PEA®) and the electronic medical record (Altamira®). Neutrophil and platelet values were recorded for each patient before treatment, at the fourth and twelfth month from the start of treatment. The means of these values were compared using Student's t-tests for paired samples, with the limit of statistical significance set at $p<0.05$. The severity of cytopenias was categorised according to the CTCAE-2017 guidelines.

Results: A total of 42 patients (35 women) were treated with sarilumab during the study period, whose mean age was 63 ± 12 years. In the first four months of treatment (n=28), mean blood neutrophils decreased significantly from 4.08 [± 1.86 (*1000/µl)] to 2.82 [± 1.68 (*1000/µl)] (p= 0.012). The mean platelet count also decreased significantly after the first months from 253 [± 92 (*1000/µl)] to 212 [± 76 (*1000/µl)] (p=0.008). From month 12 of treatment (N=27), neutrophil values averaged 3.30 [± 2.49 (*1000/µl)] and remained statistically significant difference from baseline values (4.60 [± 2.28 (*1000/µl)] (p=0.020). In addition, the mean platelet count also remained significantly lower, with a mean value of 276 [± 105 (*1000/µL)] versus 221 [± 69 (*1000/µL)] (p=<0.001) at baseline.

In the first four months of treatment, seven patients (25%) had neutropenia (4 grade II), and four patients (14%) had thrombocytopenia, all grade II. At 12 months of treatment, four neutropenia (17%) (2 grade II or higher) and four(17%) stage I thrombocytopenia were detected. Nine suspensions were due to inefficacy and six due to adverse effects (AE) (3 due to neutropenia).

Conclusions: The statistically significant decrease in neutrophil and platelet counts is a limitation of sarilumab treatment and leads to its discontinuation in many patients. Close monitoring of this type of AE is necessary throughout treatment to clarify how it evolves over a longer time frame.

The information that direct healthcare professional communications offer us

Ana G. Mariño[1]*, Marcos Gallego[2], Cecilia F. Lastra[1], Pilar Modamio[1], Eduardo L. Mariño[1], Cecilia Mariño[1]

[1]Clinical Pharmacy and Pharmaceutical Care Unit, Faculty of Pharmacy and Food Sciences, University of Barcelona, Barcelona, Spain

[2]Hospital Sagrat Cor, Barcelona, Spain

** emarino@ub.edu*

Introduction: Before drugs are marketed, they are subjected to a series of non-clinical and clinical studies that will define for a therapeutic indication how to use them correctly. However, these studies are limited, so it is essential to subject medicines to post-marketing control and surveillance (Pharmacovigilance). Different tools are available on the Spanish Agency for Medicines and medical devices (AEMPS) website to communicate updates on drug safety and risk prevention measures to healthcare professionals, including direct healthcare professional communications (DHPC). There are a few studies on them, although their importance as a tool for improving safety in the use of medicines is high. It has been a motivation for carrying out this study.

Objectives: The main goal was to study the DHPC published on the AEMPS website, analyse which medicines have been our country's communication object, and establish which have been the most frequent variables.

Methods: A cross-sectional descriptive study was conducted analysing all the DHPCs published on the AEMPS website between January 2015 and April 2021. The variables were: the number of DHPCs, active principle, therapeutic group according to the Anatomical therapeutic chemical (ATC) classification system, prescription conditions, post-authorisation safety study, additional follow-up, new biological, new active principle, biosimilar medicine, orphan drug, type of alert, alert with death, warning in authorised indication, kind of recommendation, an average of years between the first marketing authorisation and the year that DHPC was published. A descriptive statistical analysis was performed for each variable, estimating their frequency by percentage.

Results: 125 DHPCs published on the AEMPS website were analysed. These DHPCs included 166 different active

principles. Most drugs (31.3%) belong to group L (antineoplastic and immunomodulatory agents) of the ATC classification, followed by J (antiinfectives for systemic use) and A (alimentary tract and metabolism). Group R (respiratory system) is the one that includes fewer drugs. The average time between the first authorisation and the date of publication of the security letter was 13 years, ranging between 0.14 and 63 years. The primary type of alert was warnings and special precautions in using medications (30.1%), followed by adverse reactions (29.5%). 27% of the letters refer to death results. The main recommendation to health professionals was not to use it in certain circumstances (25.3%), followed by extreme patient monitoring during treatment (23.5%). The lowest recommendation was communication with the patient regarding medication administration (0.6%).

Conclusions: DHPC provides recent and updated information to promote the safe use of drugs which is essential because risk management must be carried out throughout the life cycle of a drug.

Safety assessment decision support for excipients in medicinal products

Froukje Harkes-idzinga*, Maaike de Wit

Medicines Information Centre, Royal Dutch Pharmacists Association (KNMP), Den Haag, Netherlands

** f.harkes-idzinga@knmp.nl*

Introduction: Some excipients in medicinal products could cause undesirable or harmful adverse events under certain circumstances. Therefore, information for safety decision support for certain excipients in medicinal products is needed.

Objectives: To provide pharmacists with safety assessment decision support for excipients in medicinal products during dispensing.

Methods: The authors identified excipients used in medicinal products that could cause undesirable or harmful adverse events from the Annex to the European Commission guideline on 'Excipients in the labelling and package leaflet of medicinal products for human use.' A review of scientific literature and standard reference works is carried out as well.

Results: Based on their review, the authors provide practical guidelines for safety decision support for excipients in medicinal products through the modules Allergy, Contraindication, and Minimum Age in the Dutch drug database G-Standaard. This information is incorporated into electronic healthcare systems, which in relevant situations, leads to an alert during the dispensing process. Such an alert could, for example, pop up when a medicinal product containing propylene glycol is prescribed to a child under five or when a product containing aspartame is prescribed to a patient with phenylketonuria.

Conclusion: Dutch pharmacists are provided with safety assessment decision support for excipients in medicinal products during dispensing through information in the Dutch drug database G-Standaard and background information on a website.

Information provision about medicinal cannabis in the Netherlands

Reda Harmane*, Froukje Harkes-idzinga

Medicines Information Centre, Royal Dutch Pharmacists Association (KNMP), Den Haag, Netherlands

** r.harmane@knmp.nl*

Introduction: The use of medicinal cannabis in the Netherlands has increased. A legal assessment of effectiveness versus safety, as is customary for registered medicines, is lacking; therefore, information about prescribing and dispensing medicinal cannabis is needed.

Objectives: To inform caregivers about the indications, dosage, side effects, and drug monitoring of medicinal cannabis in the Netherlands during the prescribing and dispensing.

Methods: In recent years, the number of prescriptions for medicinal cannabis in the Netherlands has increased dramatically. Pharmacists and other healthcare professionals are increasingly receiving questions about medicinal cannabis from patients. Hence the authors reviewed scientific literature, guidelines, product specification documents, and standard reference works about medicinal cannabis to provide healthcare professionals with reliable information which can be used in daily practice.

Results: Based on the review, the authors provided practical guidelines and information for the use of medicinal cannabis through the Dutch reference book Informatorium Medicamentorum and the Dutch drug database G-Standaard. The information in the Informatorium medicamentorum consists mainly of pharmacotherapeutic data, which pharmacists can consult during dispensing and advising physicians. The information in the G-Standard is incorporated in electronic healthcare systems, which in relevant situations leads to an alert during the prescribing and dispensing processes.

Conclusions: Healthcare professionals in the Netherlands are provided with relevant information about medicinal cannabis during the prescribing and dispensing through background information in the Dutch reference book Informatorium Medicamentorum and the drug database G-standard.

Development of a web-based application for the improvement of population health habits against SARS-CoV-2

Nieves Muñoz-Doncel[1], María Teresa Díaz-Carmona[1], Luis M. Rabasco[2], Manuel Pérez-Fernández[3], Federico Martín-Zamorano[3], Juan Pedro Vaquero[1], Pedro Bueno[1], María Luisa González-Rodríguez[1], Antonio M Rabasco[1]*

[1]*Cátedra Avenzoar - Colegio de Farmacéuticos de Sevilla, Spain*

[2] *Universidad de Sevilla, Spain*

[3] *Colegio de Farmacéuticos de Sevilla, Spain*

** amra@us.es*

Introduction: The project began in 2020, in the first moments of the COVID-19 pandemic caused by the SARS-CoV-2 virus, when primary and general information was required on aspects related to hygienic-sanitary measures that would help to control and prevent the spread of the disease in the population.

Objectives: The aim is to provide an evaluation tool for the degree of knowledge of the disease in the community and to give recommendations about behavioural practices to prevent infection.

Methods: The application was developed by the "Cátedra Avenzoar – Avenzoar Chair" research team from the University of Seville and the College of Pharmacists of Seville. The COVID-19 app is an online tool accessed at: https://covid.catedraavenzoar.es. Through ten general questions, it is intended to provide information on health education to prevent COVID-19 infection. After completing the questionnaire, the system, applying an algorithm, shows a score ranging between 0 and 100 points. In those cases where it is considered necessary, a brief information message is issued so that wrong conduct can be corrected.

Results: The application can be displayed in six languages (i.e., Spanish, French, English, German, Italian, and Portuguese). Its expansion has been remarkable, given that nearly 1.5 million people have used it, and it has run almost 2 million times in 170 countries worldwide. This data have been obtained through Google Analytics. The tool has been primarily used in Mexico and Spain, including all major cities and all regions. Later, the application was improved; in essence, the system now shows the mean of the data obtained in every one of the countries where it has been run. Therefore, correlating the scores with the natural spread of COVID-19 in those countries would be possible.

Conclusions: The COVID-19 app has contributed significantly to health education by providing a better knowledge of the disease and correcting bad hygiene habits and behaviours, helping avoid infections and deaths to a greater or lesser extent. This web-based app shows that cooperation between universities and professional Pharmacies yields excellent results regarding people's health worldwide.

Review of terminology management tools used in pharmaceutical translations

Kaspars Melkis*

GPhC registered locum pharmacist and translator, La Laguna, Spain

**melkis@avepri.com*

Introduction: Translations play an essential role in the global health information and regulatory landscape, and precise and consistent use of proper terminology is critical and required by regulators.

Objectives: To critically evaluate different terminology databases and tools for translating many languages.

Methods: The primary terminology sources are national regulators, EMA, MedDRA, and EDQM, and some of them provide online tools.

Results: Based on a survey of freelance translators who provide services to pharmaceutical companies and regulators, the main tools and terminology sources used in practice are identified. The findings indicate that many translators struggle to integrate these tools into their workflow.

Conclusions: There is a need for better access and software integration to reduce mistakes and improve the consistency and quality of pharmaceutical translations into European languages.

Food-medication interaction: Writing a treatise

Cristina Abuin Martínez[1], María Antonieta de Andrés Dirube[2], Carmen del Campo Arroyo[3], Rebeca Cuenca Velasco[4], Aquilino García Perea[1]*, María Jesús Moreno-Aliaga[5], Josep Antoni Tur Marí[6], Elena Vega Martín[1]

[1]*General Pharmaceutical Council of Spain, Madrid, Spain*

[2]*Pharmaceutical Provincial Chamber of Cantabria, Santander, Spain*

[3]*Pharmaceutical Provincial Chamber of Ciudad Real, Ciudad Real, Spain*

[4] *Pharmaceutical Provincial Chamber of Zamora, Zamora, Spain*

[5] *Pharmaceutical Provincial Chamber of Navarra, Pamplona, Spain*

[6] *Pharmaceutical Provincial Chamber of Baleares, Palma de Mallorca, Spain*

** danielffont@redfarma.org*

Introduction: Pharmacists are, by definition, medicine technicians. However, we are also food/nutrition counsellors due to our undergraduate and postgraduate training. There is no other health professional as accessible to the population as pharmacists and with sufficient knowledge to deal with food-medication interactions with the necessary rigour.

Objectives: This study aims to write a treatise on food-medication interactions with scientific rigour, assessing them and making them understandable and valuable to pharmacists and other health professionals.

Methods: The work has been carried out by 37 authors in 30 chapters. The stages of cooperation include- 1. Bibliographic research: databases (PubMed, Cochrane, Scielo, BotPlus), websites (Farmacéuticos, SEFH, CIMA, EMA), and written literature. 2. Data synthesis and content development. 3. Reviews and evaluation of the work. 4. Layout and publication.

Results: This treatise is intended to be a benchmark text on food-medication interactions. Following the presentation and dissemination, it will be possible to assess its impact on students and health professionals.

Conclusions: There is isolated information on food-medication interactions. A benchmark text is needed to unite all this scattered information in a unified way and under scientific criteria. This is the space that will be occupied by the treatise that has been prepared. Presenting charts, summaries, and examples in the Treatise will facilitate consultation with healthcare professionals. It is essential to consider interactions between food and medicines and vice versa, considering the different situations that may arise in the patient.

Medicamento ACCESIBLE plus: A tool at the patient's disposal

Antonio Blanes Jiménez,Tamara Dorado Romero, Iván Alejandro Espada Ibáñez*, Cristina Fernández Marcos,Carlos Fernández Moriano, Paula Mateos Sánchez

[1]*General Pharmaceutical Council of Spain, Spain*

** ivanespada@redfarma.org*

Introduction: MEDICAMENTO ACCESIBLE Plus is a free application to be used on mobile devices - smartphones and tablets - promoted by the General Pharmaceutical Council of Spain, ONCE Foundation, and Vodafone Spain Foundation, which provides patients with up-to-date, rigorous, and contrasted information on medicines, leading to the rational use of medications and a greater awareness of their illnesses and their treatment.

Objectives: The main aim is to provide a solution that improves the accessibility of medical information through technology. The information must be fully accessible to ensure it can be understood, regardless of the user's functional capacity. MEDICAMENTO ACCESIBLE Plus continually evolves regarding features and contents to adapt to the needs and growing demand for information from users, especially those with impaired vision, hearing, or manipulation problems, including older adults.

Methods: During the past year, 2021, and the first quarter of 2022, the tool's new needs were analysed between the three participating entities to seek improvements and technological solutions. The technical information of MEDICAMENTO ACCESIBLE Plus comes from BOT PLUS, the database of medicines and over-the-counter products designed and updated by the General Pharmaceutical Council of Spain.

Results: Available for iOS and ANDROID, the new version of the app makes it easier to find information on medicines by capturing the Datamatrix codes on the packaging; users will be able to highlight the medication they take for quick access to their data. It is now possible to add the expiry date of the medicines taken by the patient so that the tool will issue a warning when this date is approaching to contribute to the safety of the treatments prescribed by the doctor. In addition, new customisation options have been added to the existing ones (such as pregnancy or breastfeeding), allowing users to indicate whether they are phenylketonuric or allergic to soy, peanuts, or latex. Therefore, the application will warn the user of these substances in the medicines.

Conclusions: MEDICAMENTO ACCESIBLE Plus, launched eight years ago, included new features that enhance its universality and interaction with the patient, improving accessibility to a reliable, updated, and understandable source of information on medicines, which can facilitate a

correct process of use of drugs, which will improve the health and personal autonomy of patients, enhancing their personal development and their inclusion in the labour market. It is now mature and sustainable, with regular updates, and has achieved a high level of acceptance among patients and users, with more than 90,000 installations.

Sentinel Pharmacy network of Catalonia: What knowledge do women have about the isotretinoin teratogenic effects?

Anna Maria Jambrina[1]*, Glòria Cereza[1], Pilar Rius[2], Montserrat Gironès[2], Neus Rams[1], Clara Pareja[1], Manel Rabanal[1]

[1]Ministry of Health, Government of Catalonia

[2]Council of the Pharmacist's Association of Catalonia

** amjambrina@gencat.cat*

Introduction: The risk of congenital malformations after exposure to isotretinoin during pregnancy is already known. However, the implementation of the pregnancy prevention programme and the adoption of measures to minimise these risks by health institutions have not been effective enough, as proven in the EVITA study on the implementation and compliance with the pregnancy prevention program carried out in 2016 by the Spanish Agency of medicines and medical devices.

Objectives: To analyse the patient's knowledge about the risks associated with using isotretinoin during pregnancy and compliance with risk minimisation measures.

Methods:: A cross-sectional observational study was carried out in 75 community pharmacies of Catalonia's sentinel pharmacy network between May 2021 and April 2022. Pharmacists identified isotretinoin dispensations in adult women of childbearing age (18-55 years) and, using an electronic questionnaire, collected information on the therapeutic indication, knowledge of the risks, use of contraceptive methods, and pharmaceutical action.

Results: 148 adult women of childbearing age were treated with isotretinoin (91.2% were diagnosed with severe acne). The average age was 26.5 ± 8 years (median 25 years). 29.1% of them had not received previous treatment. 75% were aware of the risks of becoming pregnant, and the doctor informed the patient in 51% of cases. 44% of the patients said they did not receive any informative material or did not remember it, while 74.3% signed the risk awareness form. 92.6% did not plan to become pregnant. 29.7% took a pregnancy test before starting treatment, and only 52.3% repeated the test during treatment. 68% of the patients used some contraception method. Finally, in 58.1% of the cases, the pharmacist took additional informative action.

Conclusions: Most women on isotretinoin treatment were aware of the teratogenic risks associated with its use. Nevertheless, in half of the cases, women did not receive informative material about prevention and pregnancy control measures. Health professionals should stress the importance of using contraceptive methods during the treatment and until the month following the treatment's end and the need to perform pregnancy tests before and during treatment with isotretinoin. The role of community pharmacists in risk minimisation activities should be enhanced.

Guidelines for ailments treatable by over-the-counter medications

Nuhoda Aldarij*, Suzan Gipmans

Centre for Information on Medicines, The Royal Dutch Pharmacists Association, The Hague, Netherlands

** n.aldarij@knmp.nl*

Introduction: Over-the-counter (OTC) medicines are widely available and purchased by consumers. These medicines are often used to treat minor ailments, but evidence regarding their effectiveness is sometimes lacking. Therefore, the Centre for Information on Drugs has set up evidence-based guidelines for OTC medication use when treating minor ailments.

Objectives: To provide insight on guidelines for minor ailments possibly treatable by OTC medication.

Methods: The guidelines are set up in collaboration with healthcare professionals. To set up these guidelines, literature, a summary of product characteristics, and existing policies are carefully evaluated. The guidelines for ailments suggest which questions should be asked, such as: who is suffering from the disease, what the patient has tried so far, and which other medication the patient is using. These questions are essential to determine which OTC medicine the patient should receive. Based on the answers to these questions, the guidelines suggest which OTC medicine should be used, how this should be used, and which contra-indications and interactions are relevant. Furthermore, the guidelines suggest when a patient should be referred to a general practitioner and which non-medicinal advice can be given.

Results: Currently, more than 23 guidelines are available. These guidelines include but are not limited to haemorrhoids, acne, diarrhoea, and abdominal pain. Pharmacists and pharmacy personnel widely use these

guidelines. Furthermore, these guidelines are used for educational purposes.

Conclusions: The practical guidelines for ailments are available in books and online. They help pharmacists and pharmacy technicians provide evidence-based recommendations and improve medication safety.

Drug-drug interaction alerts and clinical Relevance: Pharmacokinetics and risk analysis

João Peres, Joana Pinto*, Amadeu Mendes, André Violante ,Catarina Nunes, Raquel Martins, António Salvador, Rute Horta

Infosaúde, Lisboa, Portugal

** joana.pinto@anf.pt*

Introduction: The available evidence about the clinical impact of drug-drug interactions is often limited and inconclusive. Many low-relevance alerts are generated in prescription or dispensing systems, compromising their acceptance by health professionals.

Objectives: Development of a methodology to allow the rigorous assessment of the risk and clinical relevance of drug-drug interactions (DDI) to establish a robust database with high applicability in clinical practice, with particular attention drawn to pharmacokinetics and additive risk analysis.

Methods: Construction of pharmacokinetics matrices focused on the potential interaction with enzymes such as CYP, BCRP, gpP, OAT, OATP, OCT, and UGT. Risk analysis was also translated into the construction of matrices focusing on the potential for QT interval prolongation, nephrotoxicity, neurotoxicity, myelosuppression, neuromuscular blockage, ototoxicity, and bradycardia.

Results: Currently, there are 911 drugs classified in pharmacokinetics matrices and 2069 in the other matrices mentioned above. Relevant interactions are considered according to potential additive effects and pharmacokinetic properties.

Conclusions: Establishing standardised and objective criteria for analysing information, applied to the compilation of pharmacokinetic and risk matrices, provides a reasonable manner to sort through discrepant and, sometimes, insufficient information resources. It allows a more rigorous validation of the information to be integrated into a platform to support DDI alerts resulting in an increased clinical value knowledge platform able to help high acceptance of DDI alerts.

A systematic approach to scrutinising noises in Medical Literature

Yu Ya Hwang*

Taipei Medical University, Taipei City, Taiwan

**y.in.world.health@gmail.com*

Introduction: Identifying errors in the medical literature has always been a tricky issue in health information. Even in official documents reviewed by multiple healthcare professionals, redundant noises and minor mistakes are still more common than we anticipated. Furthermore, if the proofreaders and testers of the paperwork are prejudicial, the proofreading and authoring phases can be postponed due to biases.

Objectives: This article aims to resolve the prevalent challenges in health information and provide hands-on solutions to each problem. I hope to develop novel health information processing techniques and enhance information delivery.

Methods: To scrutinise noises in medical literature efficiently, it is recommended to use the GATE checklist, which the author developed as a tool to improve communication in health and medicines information.

Results: Health literacy is a skill that can be polished through years of practice. However, as healthcare practitioners get more and more experienced in their careers, it's very likely for practitioners to take experiences as evidence of professionalism.

Conclusions: As the saying goes, "Self-righteousness is a powerful drug." This article was written to remind experienced healthcare practitioners to stay aware of the noises in the document and the potential prejudices and self-righteousness we may hold.

Portuguese Index of access to hospital medicines 2021 – An improved indicator

Ana Margarida Advinha[1,2]*, Miguel Lopes[3], Alexandra Santos[3], Sofia Oliveira-Martins[1,4]

[1]*Comprehensive Health Research Centre (CHRC), Evora, Portugal*

[2] *University of Evora, Evora, Portugal*

[3]*APAH - Associação Portuguesa de Administradores Hospitalares, Lisboa, Portugal*

[4]*Faculdade de Farmácia da Universidade de Lisboa, Lisboa, Portugal*

** anamma@uevora.pt*

Introduction: Medicines are primarily responsible for increasing life expectancy and improving quality of life. Access to innovative and effective medication is a citizen's right. It is, therefore, essential to identify barriers to their access, particularly within the NHS, to minimise existing barriers and inequalities. The WHO defines access to medicines using two primary metrics: availability and affordability. Nonetheless, up to now, there is no consensual model to monitor medicine access in a country or to make comparisons across countries. Following the first edition of the Index (2019), a second edition was launched in 2021, with a new methodology to obtain a more sensitive and objective indicator to measure and monitor access to medicines.

Objectives: This study aims to build an indicator to measure access to medicines and the level of access to hospital medicines, identifying the existing barriers and problems associated with drugs within NHS hospital units.

Methods: Cross-sectional study in Portuguese NHS Hospitals, promoted by APAH – Portuguese association of hospital managers, using a questionnaire built based on the opinion of a consensus group. An expert panel of seven members was previously consulted using a consensus methodology to define the dimensions that should integrate the index of access and the weighting that every size should assume. Six measurements were identified as relevant to incorporate the formula of the index: 1. Access to innovative medicines (the same as the one used in the 2019 edition); 2. Proximity distribution; 3. Shortages; 4. Access to drugs before the final financing decision (pre-MA and post-MA); 5—Value-based health care; 6. Access to medication depends on cost/financing. Data was collected through an electronic questionnaire sent to all NHS hospitals in mainland Portugal in September 2021.

Results: The response rate was 61,2%. Most hospitals used medicines without MA (using a special national utilisation authorisation) and with MA but still with no government funding, thus ensuring overall access to therapeutic innovation. After the financing decision, in most institutions (80%), access to innovative medicines occurs only after inclusion in the National Formulary.

Monitoring and generating evidence for the results of new therapies within institutions is still insufficient – 53% of the institutions perform this kind of analysis. Administrative burden was again identified as the primary barrier in purchasing medicines, with an also still relevant impact on shortages of drugs. 87% of the respondents had a proximity distribution programme, mainly implemented during the pandemic. The price/financing model was only identified by 10% as a barrier to access to medicines. The 2021 Portuguese INDEX FOR ACCESS TO HOSPITAL MEDICINES was 66%. Shortages and value-based use of drugs were the dimensions that had more influence in lowering the index value.

Conclusions: The new formula used to obtain the Index in 2021 seems more sensitive and objective. The new indicator will be used yearly to monitor access to hospital medicines in Portugal.

Implementation of ISO 27001 -2013 on the pharmacist information system (SIAp) application to ensure compliance with personal data security requirements

Agus Sulaeman[1,2]*, Hilwan Yuda Teruna[1,3], Catleya Febrinella[1,4], Fauzan Zein Muttakin[1,5], Rudi Hendra[1,3], Noffendri Rustam[1], Nurul Falah Eddy Pariang[1], Sherly Mellianti[1]

[1] *The Indonesian Pharmacists Association, Indonesia*

[2]*Department Pharmacology and Clinical Pharmacy Faculty of Pharmacy Universitas Bhakti Kencana, Indonesia*

[3]*Department of Chemistry FMIPA Universitas Riau, Indonesia*

[4]*Indonesian Pharmacists Association Provincial Organiser, Indonesia*

[5]*Department of Pharmaceutical Analysis and Medicinal Chemistry Faculty of Pharmacy Universitas Bhakti Kencana, Indonesia*

** agus.sulaeman@iai.id*

Introduction: The pharmacist information system (SIAp) was developed by the central organiser of the Indonesian Pharmacists Association to provide membership services for all pharmacists in Indonesia. The SIAp system stores various important data entered by members. Therefore, the security of personal data must be protected. Consequently, the national committee implemented ISO/IEC 27001-2013 for the Security management system.

Objectives: This research aimed to describe SIAp's efforts to ensure data security through ISO/IEC 27001-2013 certification.

Methods: The descriptive quantitative research design included coverage of the national committee, West Java as a

provincial organiser, Bandung City as a regency organiser, and the IAI partner Channa striata MediaTek.

Results: The results obtained were the efforts made to build an information security quality system beginning with the president IAI's policy regarding the Indonesian information security management system ISO/IEC 27001-2013, a situational gap analysis to build a Security Management System, an analysis of internal and external issues, a SWOT analysis, stakeholder analysis, an analysis of business process maps, the preparation of document manuals, and an analysis of risk management to determine the level of risk.

The Pharmacist Information System (SIAp) breaks the distance and time boundaries in Indonesian Pharmacist services

Fauzan Zein Muttaqin[1,2]*, Nurul Falah Eddy Pariang[1], Noffendri Rustam[1], Hilwan Yuda Teruna[1,3], Rudi Hendra[1,3], Agus Sulaeman[1,4], Catleya Febrinella[1], Sherly Melianti[1]

[1] The Indonesian Pharmacist Association, Indonesia

[2]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Bhakti Kencana University, Indonesia

[3]Department of Chemistry, FMIPA-Universitas Riau, Kampus Bina Widya Km 12.5, Indonesia

[4]Department Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Bhakti Kencana University, Indonesia

** fauzanzein@iai.id*

Introduction: Indonesia is an archipelagic country consisting of 16,771 inhabited islands. The organiser of the Indonesian Pharmacists Association (IAI) includes a central organiser, 34 provincial organisers, and 416 regency organisers. More than 86,000 registered IAI members are dispersed throughout Indonesia, making it challenging to provide members with services. Members applying for administrative services are hindered by the distance and duration of their travel to the primary office.

Objectives: This study conveys that the Pharmacist Information System (SIAp) eliminates geographical and temporal barriers in Indonesian pharmacist services.

Methods: This descriptive study collected data on the administrative services that IAI members provided through SIAp between January and April 2022.

Results: According to the data collected by SIAp in January–April 2022 on the activation, registration, inter-regency and inter-province transfer, recommendation, and recertification services provided to members, there was no significant difference in the amount of time required for member administrative services from province to province. This demonstrates that Indonesian Pharmacists who practice in regions very far from the headquarter receive the exact duration of service as other Indonesian Pharmacists who practice in areas very close to the headquarters.

Conclusion: The Pharmacist Information System (SIAp) can solve the problem of distance and time for IAI to provide services to members.

A study on the effect of steroids on acute inflammatory markers in COVID patients

Sumalatha D *, John Kirubakaran Joseph Sunder Singh, Satya Sri Nimishakavi, M Sumanth, P Sarath Kumar, A Ajay Kumar

Vikas Institute of Pharmaceutical Sciences, Rajahmundry, India

** sumacology@gmail.com*

Introduction: Corticosteroids are a potential therapeutic agent for patients with COVID-19 pneumonia. The RECOVERY (Randomised Trials in COVID-19 Therapy) trial provided data on the mortality benefits of corticosteroids.

Objectives: The study aimed to determine the association between corticosteroid use on mortality and the improvement of C-reactive protein, Interleukin-6, D-Dimer, Lactate Dehydrogenase, Serum Ferritin, Serum Procalcitonin in COVID-19 patients.

Methods: Clinical data were extracted that included demographic, laboratory data, and details of the therapy, including the administration of corticosteroids, and in comparison, with the laboratory values. The primary outcome was in-hospital mortality, and secondary outcomes included comparing lab values between recovered and deceased.

Results: 125 case reports were collected from the tertiary care hospital. The case reports state that comorbidities such as hypertension 37.6%, Diabetes 28.8%, 29.6%, and no comorbidities 4% were there. Based on the reports, 74.4% of patients recovered, and 25.6% died. The paired T-Test results of C-reactive protein ($p \leq 0.05$), Interleukins-6 ($p \leq 0.05$), serum ferritin ($p \leq 0.05$), serum LDH ($p \leq 0.05$), serum D-dimer ($p = 0.039$), serum procalcitonin ($p = 0.073$), showed a significant change in between the recovered and deceased.

Conclusions: COVID-19-related mortality is linked with inflammatory markers and cardiovascular problems, glycaemic management, and high BMI are associated with outcomes such as ICU hospitalisation and mechanical ventilation, demonstrating their role as independent risk factors for COVID-19-related death. In patients hospitalised

with COVID-19 pneumonia, corticosteroid use as initial therapy has decreased mortality. The disease progression can be seen by estimating D-dimer and C-reactive proteins.

Health education during a pandemic: An online intervention about the responsible use of medicines in older people

Sofía Segura Cano*

University of Costa Rica, Costa Rica

**sofiaesc@gmail.com*

Introduction: Education is the transforming force of society; therefore, health education is an essential task that will allow changing the paradigm from patient to collaborator in health management. Specifically, regarding medicines, the pharmacist must go beyond being an informant to become a facilitator of learning.

Objectives: During the pandemic and due to social distancing, it was tough to reach people, especially older people, to promote the responsible use of medicines and clarify misconceptions about issues related to covid-19 and vaccination, among others. For this reason, it was necessary to implement digital tools to meet this objective.

Methods: Online courses on the responsible use of medicines were developed for adults over 50 years of age based on the principles of educational gerontology. The general objective was to create the necessary knowledge and tools to make good and responsible use of medications and the information related to them to ensure that the participants have an active role in managing their therapy. Educational measures were implemented to reduce the digital gap among older people, including digital literacy and volunteering.

Results: Three virtual courses were offered from September 2020 to June 2021. Sessions were provided weekly, two methods lasted 16 weeks, and the other lasted eight weeks. A total of 20 people participated, 80% women, with an age range of 52 to 81 years old. In addition, two elderly volunteers and three students collaborated as assistants. The courses were developed synchronously through the Zoom and WhatsApp platforms. Additionally, asynchronous tasks were created by the participants per the learning objectives.

The course had a highly participatory approach based on people's experiences with their therapy, working independently of the students' current illnesses. The contents included: drug research and development; Costa Rican regulations on medicines; secure search of medical information on the internet, dangers of substandard drugs; correct storage, use, and disposal of medications; responsible self-medication; bacterial resistance problems; Covid-19 update; the importance of vaccination in the life course; the importance of pharmacovigilance; and therapeutic approach to the leading chronic diseases in the country. It was necessary to develop dual learning: one related to the contents of the course and another related to digital tools. Due to the digital gap, it is essential to encourage and educate on using technology as information and communication.

Conclusions: Patients need to learn about the responsible use of medicines based on high-quality scientific information. Therefore, they require the knowledge and tools to search and analyse the available information. In this way, they will be able to become aware of their drug therapy. Pharmacists can facilitate the acquisition of skills in a participatory manner, especially in older people, who are primarily polymedicated. The possibility of offering online courses provides a dual benefit to older people: one related to the system's contents and another to using digital tools.

Hormonal and non-hormonal contraceptives: Education for patients through a virtual platform

Victoria Hall*

National Drug Information Centre (CIMED), Pharmaceutical Research Institute (INIFAR). Faculty of Pharmacy, University of Costa Rica.

**victoria.hall@ucr.ac.cr*

Introduction: The National Drug Information Centre of Costa Rica (CIMED) aims to promote the rational use of medicines through the communication of information, medication therapy management, and public health actions in pharmacy through social movement and research.

Objectives: To describe the design and implementation of a 100% virtual course of contraceptive methods aimed at patients.

Methods:: Description of the case report about designing and implementing a virtual patient course.

Results: The initiative "Costa Rica learns with the public U" is an inter-university affirmative action where the five public universities - the University of Costa Rica included - make available to the national community an offer of free virtual courses as a way of maintaining a constant dialogue of knowledge and contributing to the acquisition of new skills and abilities through training spaces in various areas of the lives of the people concerned. CIMED is part of the University of Costa Rica, so the approach of a virtual course

in the initiative described above was entirely relevant. During the first semester of 2022, the "Contraceptive Methods: a space to Learn and Ask without Judging" system was planned and taught, and women of reproductive age attended it. The objectives of the course were that, at the end of it, participants should have the ability to:

a)Know the main methods of contraception available in the country.

b)To identify the information that, as a patient, each person must provide to the health professional to select the contraceptive that fits their needs jointly.

c)Recall the professional's role in pharmacy to benefit the sexual and reproductive health of the population.

A total of eight 100% synchronous virtual sessions were delivered through the Zoom platform, and the UCR Global site was used as the course website. In addition to the master classes, techniques such as videos, educational gamification, and a weekly question session were used in 50% of the lesson time. One of the innovations of the course was to show each participant, through the camera, the different contraceptive options in the market, so by their own eyes; they could identify which pharmaceutical form is convenient to use, for example, pills, injections, patch, vaginal ring or intrauterine device, among others. The Q&A sessions in a safe listening environment enabled participants to tell their personal histories and the difficulties they have experienced in accessing and using effective and safe contraceptive methods, including emergency contraception. The participants have expressed their interest in sharing the information received with their friends, relatives, and in their work, which contributes to education about sexual and reproductive health in a country where such topics remain taboo.

Conclusions: A drug information centre can educate patients not only through face-to-face and telephone or through printed and digital educational materials but can and should take advantage of today's technological advances to reach more extensive and diverse populations, seeking to encourage the rational use of medicines.

International expansion of the Vaccination Champion project to promote vaccination confidence and address vaccine hesitancy

Nusayba Ali[1]*, Isabel Cheng[2], Yannee Liu[3], Hanna Kumwenda[4], Séverine Péchiné[5], Suzanne Caliph[3], Sachiko Ozawa[2], Amanda Savage[2], Caroline Sasser[2], Diane Ashiru-Oredope[1], Sudaxshina Murdan[1], Betty Exintaris[3], Julia Gilmartin-Thomas[3,6], Nilushi Karunaratne[3]

[1]University College London (UCL) School of Pharmacy, United Kingdom

[2]UNC Eshelman School of Pharmacy at the University of North Carolina at Chapel Hill, United States

[3]Monash University Faculty of Pharmacy and Pharmaceutical Sciences, Australia

[4]UNC-Project Malawi and Kamuzu Central Hospital, Malawi

[5]Institut MICALIS , Faculté de Pharmacie, Université Paris-Saclay, France

[6]Institute for Health and Sport, Victoria University, Australia

** nusayba.ali.18@alumni.ucl.ac.uk*

Introduction: The World Health Organization named vaccine hesitancy as one of the top ten threats to global health in 2019. In the context of the Covid-19 pandemic, addressing vaccine hesitancy has become paramount. To promote vaccination confidence and address vaccine hesitancy, a vaccination champion course was designed and piloted at University College London (UCL) School of Pharmacy in 2020 to equip Pharmacy students with the knowledge and skills to advocate vaccination and address hesitancy. This project was expanded to reach a global audience in 2021 and 2022, focusing on COVID-19 vaccines following their deployment. The course contents were adapted and delivered by local teams consisting of Pharmacy students/learners and staff at five institutions: the UCL School of Pharmacy, the UNC Eshelman School of Pharmacy at the University of North Carolina at Chapel Hill, Monash University Faculty of Pharmacy and Pharmaceutical Sciences, Université Paris-Saclay, and UNC-Project Malawi.

Objectives: The aim is to evaluate the impact of a global vaccination champion course. Additionally, this expansion elucidated differences in knowledge, beliefs, and attitudes regarding vaccination worldwide and how collaborators from different countries can share, adapt, and personalise educational materials for local needs.

Methods: The vaccination champion course comprised a 2 - 2.5-hour workshop and pre-and-post-workshop questionnaires. The pre-workshop questionnaire assessed existing knowledge, beliefs, and attitudes regarding vaccination. The post-workshop questionnaire asked the same questions as the pre-workshop questionnaire to examine changes in participants' knowledge, ideas, and attitudes regarding vaccination following the workshop. The post-workshop questionnaire also included a vaccination

advocacy assignment (a vaccine-promotion action) and a feedback section. The pre-and post-workshop questionnaires were analysed using descriptive statistics.

Results: The vaccination champion course was conducted separately at each participating institution. Overall, the following number of workshops were conducted in 2021 and 2022: one workshop at UCL (virtual), two at UNC (one virtual, one in-person), one at UNC-Project Malawi (in-person), one at Université Paris-Saclay (in-person) and one workshop at Monash University (virtual). A total of 164 participants across five institutions completed the pre-workshop questionnaires, and 60% achieved the post-workshop questionnaire and vaccination awareness and advocacy tasks. Pooled data from all sites showed a net increase of correctly answered statements regarding vaccination knowledge recorded in the post-workshop questionnaire compared to the pre-workshop questionnaire. Post-workshop questionnaire analyses also revealed that participants were less likely to believe in vaccine misconceptions and more likely to engage with vaccination advocacy and address hesitancy after the workshop.

Conclusions: Overall, the authors discovered that the vaccination champion course effectively prepared and empowered participants to promote the benefits of vaccination and address vaccine hesitancy across all institutions. The global expansion of the course demonstrated collaboration within pharmacy education and how curricula can be shared and adapted to suit regional interests while maintaining the overarching objectives of the vaccination champion course.

Xarxa patients: Educating in self-care and empowerment of patients

Ester Piquer-Fideli*, Amparo Esparza-Tudela, Pilar Ordaz-Gil1, Roberto Higon-Torres, María Teresa Torres-Bartual1, Luisa Gimenez-Gaude, Azucena Aparisi-Grau, Sergio Batlles-Sendra, Ana Muñoz-Trevejo, Vicente Colomer-Molina

Muy Ilustre Colegio Oficial De Farmacéuticos De Valencia (MICOF), Spain

** esterpiquerfideli@gmail.com*

Introduction: Active patients comprise patients, caregivers, and family members. These have shown an increased interest in their chronic pathology. Since the appearance of this necessity, MICOF, in collaboration with Escuela de pacientes de la Escuela Andaluza de Salud Pública, has created Xarxa Pacients. Xarxa Patients is a project that constructs an active patient network (xarxa in Valencian) to contact patients with a chronic pathology in common, educate them on healthy habits, and manage their pathology. It will count on sanitary professionals for specific training and to solve doubts.

Objectives: As active patients get involved in their illness, a network of empowered patients engaged in different aspects of their chronic disease is created. These make them feel part of their recovery, improving their health, self-esteem, and global well-being, reducing complications and hospital admissions. Starting this network of patients and professionals provide information and support to other patients who suffer from the same pathology.

Methods: Training groups of active patients to promote work among equals, being the patients themselves who, through their knowledge and experience, help to train others in the same situation. Each course consists of three sessions of two hours in three weeks; they must meet self-defined objectives between sessions. Patients who pass the course will complete a questionnaire measuring self-perceived health, limitations, diet, and physical activity. Those who request it will be accredited as patient trainers and will guide training, assuring feedback to the project. Health professionals will provide complementary training and resolve any doubts that may arise from patients.

MICOF has enabled an open-access website (www.xarxapacients.es) with self-made material. To access exclusive materials (patients' guides, trainers' guides), patients must access them by logging into their web user profile. Patients' call is made through Valencian associations of the corresponding pathologies, media advertisements, and community pharmacies as prescribers.

Results: The first network of patients established has been on Diabetes Mellitus (DM) type I and II. Three online training courses have been organised from March to June 2022 for DM type I and II, two and one, respectively. It has had six health professionals, including doctors, pharmacists, nutritionists, and psychologists offering a multidisciplinary vision of the pathology. Xarxa patients have 68 patients in the three courses. Of the 68 patients, 12 have requested to be patient trainers, and five are pharmacists. Favourable results were obtained in the questionnaire regarding the Xarxa Patients project. Among the results obtained, the authors highlighted that 77.78% are women and 22.22% are men, 88.89% have university studies, and there is variability in their relationship with DM (44.44% are patients, 44.44% are relatives, and 11.12% are caregivers).

Conclusions: It has been detected that Xarxa Patients cover a necessity demanded by patients, which is a more excellent knowledge of their pathology and getting involved in their treatment. The first patient-trainers' participation ensures the project's continuity through their feedback.

Training talks' impact on the sustainability project of rural and vec pharmacy as a basis for the improvement of life and depopulation in a rural environment

Ester Piquer-Fideli*, Amparo Esparza-Tudela, Pilar Ordaz-Gil, Roberto Higon-Torres, Azucena Aparisi-Grau, Sergio Batlles-Sendr, Ana Muñoz-Trevejo, Salvador Gutierrez-Igual, María Gil-Peinado, Julian Navas-Puchades, María Teresa Vicedo-Salort, Vicente Colomer-Molina

Communication, Institutional Relationships and Corporate Social Responsibility Department of Muy Ilustre Colegio Oficial de Farmacéuticos de Valencia (MICOF), Spain

** esterpiquerfideli@gmail.com*

Introduction: The community pharmacy (CP) in rural areas and on many occasions of Compromised economic viability (VEC) is mostly the only health establishment within reach of the population in threatened depopulation areas. The network of pharmacies makes it possible to reach geographical points where medical attention barely goes, which is essential to guarantee a service of fundamental public interest. This project has started to improve the sustainability of these pharmacies. A subsidy of 60,000 euros is available to 21 CP in the province of Valencia with a maximum deduction of 2,000 euros/year. Half of the support is destined for improvements and adaptations of the CP, while the other half has to be used for citizens' training and education. The 15 participating CP are the only pharmacy in a rural municipality, and the total drug and sanitary products sales (SOE) must be less than 200,000 euros. They cannot exceed 300,000 euros/year, including free sales.

Objectives: To improve sustainability in rural areas and fight against depopulation through educating and training pharmacists in care services, offering continuous and quality training for the target population's interest. To inform the interested people and monitor these sessions. Health education is provided at all stages of life through pharmaceutical advice so that the self-care pattern of the population is improved to avoid diseases.

Methods: The communication and Training departments developed all the training activities and have been carried out online through the MICOF's platform (Aulafarma®). Pharmacists can access three modules: continuing education, professional services, and training talks for the target population's interest. The progression of each module has been followed to ensure proper compliance and understanding of the services offered. The follow-up of the training talks was carried out through questionnaires addressed to the population.

Results: Regarding the eleven training talks held from the 20th of December 2021 to the 3rd of June 2022, eight dealt with cognitive impairment, two with nutrition, and one with first aid. They have reached 172 people with an average attendance of more than 15 people per talk. Among the results of the questionnaires, it stands out that 93.60% are women, and 6.40% are men with an average age of more than 68 years. Regarding the level of studies, 20.18% are without studies, 56.88% have primary studies, 8.26% have secondary studies, 1.83% have professional training, 11.01% have university studies, and 1 .83% preferred not to answer. In the questionnaires, favourable results were obtained regarding the project.

Conclusions: The participation of pharmacists has encouraged to improve of sustainability in rural areas and fight depopulation through their education and training in care services, offering continuous, simple, and quality training to the population close to their CP to improve their lifestyle and health.

Medication refill adherence amongst patients in the Central Chronic Medicines Dispensing and Distribution programme in two districts of Kwazulu-Natal, South Africa, before and during the COVID-19 pandemic

Rendani Jennifer Tshilambwana*, Johanna Meyer, Kesentseng Mahlaba

Sefako Makgatho Health Sciences University, South Africa

** rendyjennifer@gmail.com*

Introduction: Access and adherence to medicines are critical for managing chronic disease and preventing morbidity and mortality. The central chronic drugs dispensing and distribution (CCMDD) programme allows patients to collect prepacked chronic medication at desired pick-up points (PuPs). The Coronavirus disease 2019 (COVID-19) pandemic resulted in movement restrictions, ultimately resulting in difficulties in accessing healthcare.

Objectives: The adherence of patients on the CCMDD programme is unknown; therefore, this study aimed to determine the proportion of adherent (>95% adherent) chronic patients on the CCMDD programme in the uMzinyathi and Amajuba districts before (1 February 2019 to 31 January 2020) and during (1 February 2020 to 31 January 2021) the COVID-19 pandemic; then determine the patient's level of medication refill adherence (MRA), and to compare the overall level of MRA for each of the pick-up points.

Methods: Data on identified variables, retrieved from the CCMDD SyNCH database, was exported to MS Excel, cleaned, and imported into Epi Info™ for statistical analysis. Categorical variables were summarised using frequencies

and percentages, and the proportion of patients with MRA≥95% was calculated. SMUREC granted ethical clearance.

Results: The final sample consisted of 20,732 patient records, with 107,069 dispenses. Females (74.7%) and HIV/AIDS (76.9%) predominated. Before COVID-19, MRA≥95% was achieved for 70.3% of patients. During COVID-19, 41.7% of 20,732 patients discontinued collecting their medicines, resulting in 71.7% of the remaining patients achieving MRA≥95% during the COVID-19 period.

Conclusions: Patients who discontinued collecting their medicines during COVID-19 should be traced to determine reasons for non-collection, including whether they are refilling their prescriptions elsewhere. These patients were excluded from the MRA calculation during the COVID-19 period, possibly explaining the slightly better MRA than before COVID-19.

Pharmacotherapeutic innovation is keeping pace during COVID-19 pandemic

Antonio Blanes Jiménez, Tamara Dorado Romero, Iván Alejandro Espada Ibáñez, Cristina Fernández Marcos, Carlos Fernández Moriano*, Paula Mateos Sánchez

General Pharmaceutical Council of Spain, Spain

** danielffont@redfarma.org*

Introduction: Panorama Actual del Medicamento (PAM) is a scientific journal published by the General Pharmaceutical Council of Spain (CGCF) whose contents include articles on the evaluation of new medicines when they are first marketed in Spain, in order to provide rigorous and up-to-date information to all its readers, most of whom are registered pharmacists.

Objectives: To assess the volume and degree of innovative medicines added to the therapeutic arsenal during the COVID-19 pandemic.

Methods: Since 2020 and until 31 May 202, the new products introduced in Spain were analysed based on the available scientific evidence and according to the information collected in the Official Nomenclature of the National Health System and in BOT PLUS, the CGCF's medicines database. According to the degree of innovation of each medicine compared to the other available options, the case studies published in the PAM journal were classified into 3 categories: i) no innovation, ii) moderate innovation, and iii) major innovation.

Results: A total of 56 new active ingredients have been first marketed in the last 29 months: 11 in 2020, 35 in 2021 and 10 in the first months of 2022. Unlike the trend of previous years, the number of new medicines introduced was negatively affected in 2020 but fully recovered in 2021 (even surpassing pre-pandemic figures) and appears to continue this path in 2022. The two licensed mRNA vaccines against COVID-19, developed in record time and whose technology constitutes a revolution in the field of vaccines, with potential application against several diseases, stand out for their degree of innovation. Examples of other highly innovative medicines include Dupilumab, Patisiran, Remdesivir, Nirmatrelvir or Voretigén neparvovec.

Conclusions: Despite the massive impact of the pandemic on economies and health systems worldwide, science continues to move forward at a rapid pace. In the period under evaluation, up to 9 medicines representing a disruptive innovation were incorporated into their therapeutic areas. The vaccines against COVID-19 stand out among all of them due to their unquestionable social and health value, which made it possible to leave behind the hardest stage of the pandemic.