Social/Clinical Pharmacy	**Assessing the influence of COVID-19 pandemic on the purchasing intention of vitamins in Kuwait using the theory of planned behavior**

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Co-authors: Co-authors: Farah AL Hamman, Manal Echchad

Abstract

Objectives Using the Theory of planned behavior model developed by Ajzen in 1985, the authors measured the influence of attitude (ATT) towards vitamins, health awareness (HA), perceived behavioral control (PBC), subjective norms (SN), and the knowledge of covid-19 (KN) on the purchasing intention (PI) of vitamins in Kuwait during the period of COVID-19.

Methods A total number of 587 Adults living in Kuwait completed the online distributed survey in both Arabic and English languages. Variables measured included Health awareness, attitude, Knowledge about Covid-19, purchasing intention, perceived behavioral control, and subjective norms. The findings indicate that HA has a significant impact on ATT.

Key findings The results revealed that HA does have a significant impact on ATT, ATT has a significant influence on PI, KN has a significant influence on ATT, KN has a significant influence on the PI, PBC has a positive influence on PI SN has a significant influence over PI, and SN positively influences PI.

Social/Clinical Pharmacy	**A pseudo-customer study to evaluate the community pharmacist's management of cough in pregnant women in United Arab Emirates (UAE)**

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Abstract

Objectives There is growing evidence for the use of pseudo-customer for the evaluation of community pharmacist's disease management, counseling and advice. This study aims to evaluate the levels of communication skills of community pharmacists when counseling pregnant woman with cough. Additionally, to identify the factors that contributes to the community pharmacist prescribing medications.

Methods This observational study conducted across 200 community pharmacies. Previously trained pseudo-patients were sent to the community pharmacists for the assessment of communication and counselling skills. Bivariate analysis and logistic regressions were performed to identify the factors that predict medication prescription.

Key findings: The majority of pharmacists were males (150; 75%), non-Arab (147; 74%) and in-charge pharmacists (118; 59%). An association between the gender of pharmacist and the ability to be proactively to ask the pseudo-customer about the description of the symptoms (p-value=0.015) was observed. A significant association between the nationalities of the pharmacists' and the capability to be proactive to ask about the description of the symptoms (p-value =0.011) was also detected. The ability of prescribing pharmacists straight away or only after a probe was dependent of job title of the pharmacist (p-value<0.001). The logistic regression revealed that not in-charge pharmacists (OR = 4.034, 95% CI: 2.063-7.887, p-value<0.001) and pharmacists who did not utilize sources of information other than their knowledge (OR = 4.347, 95% CI: 1.636-11.549, p-value=0.003) were more likely to prescribe medications to the pseudo-customers.

Conclusions The pseudo-customer method is a viable tool that improves current practice to assess the effectiveness services provided by community pharmacists. Providing continuous clinical trainings and educational interventions about cough management in pregnancy may improve the practice.

Social/Clinical Pharmacy	**The Evaluation of the effect of Receptor of Advanced Glycation End Products-Gene Polymorphism on Aspirin Resistance in Coronary Artery Disease Iraqi Patients with and without Type 2 Diabetes**

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Abstract

Objectives the aims of this study are to evaluate the association of Aspirin resistance with Receptor of Advanced Glycation End product (RAGE) – gene polymorphism in coronary artery disease Iraqi patients with and without diabetes type 2 and to detect the prevalence of Aspirin resistance in studied population.

Methods From February 2021 to October 2021, apparently healthy participants 130(97 males,33 females) not taking Aspirin served as control group and coronary artery disease (CAD) patients of 232 (166 males, 66 females) already they were on aspirin 100 mg as prophylaxis were enrolled in a cross-sectional study. The response to Aspirin is evaluated by measurement the serum level of thromboxane B2 (TBX2), which is the more stable and measurable metabolite due activity of cyclooxygenase-1 enzyme that directly inhibited by Aspirin. Accordingly, the patients were divided into two groups: sensitive and resistant to aspirin. Through polymerase chain reaction amplification of the extracted deoxyribonucleic acid, and sequencing by Sanger method to identify the polymorphism of mostly related single nucleotide polymorphisms (SNPs) of RAGE (rs1035798 and rs184003).

Key findings The total prevalence of aspirin resistance was 17.8%, for CAD patients without DM was 16.8%, while for (CAD) patients with (DM) the prevalence was relatively higher (18.9%). For both rs184003 and rs1035798, the wild type (CC) genotype was found to be significantly lower in resistant groups as compared to sensitive group, but there was significantly higher frequency of heterozygous (CT) genotype in resistant group compared to the sensitive one ($p < 0.05$).

Conclusions The prevalence of aspirin resistance in studied Iraqi patients was relatively high and risky so the specialist should be aware about such issue. The presence of (CT) genotype of rs1035798 alone or with (CT) of rs184003 are associated with increase the likelihood for patient to be resistant to aspirin.

Social/Clinical Pharmacy	**Prevalence of multidrug resistance bacteria and its association with patients' predictive factors**

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Abstract

Objectives Antimicrobial resistance (AMR) is a potentially disastrous problem that is mounting Globally. The surveillance studies are vital to contain the spread of AMR by creating evidence for national and global management and actions. the incidence of multidrug resistance bacteria (MDR) has been studied to a lesser extent in Iraq. Therefore, our study aimed to collect data evaluating the prevalence and antibiotic susceptibility patterns of MDR and explore the patient's predictive factors associated with it.

Methods The study was an observational cross-sectional study conducted in a microbiology lab in AL-Zahraa teaching hospital and ALSadar medical city, in Najaf Province, Iraq. The participants included both inpatient and outpatients of both genders present with different kinds of infections and requested for culture and sensitivity of the organisms isolated from different sources. The total sample size was 475 patients out of them 304 patients had a positive growth media. The data was collected from a laboratory test report that was designed to include the results of antibiotic susceptibility patterns from the culture and sensitivity test). The study was registered at Clinical Trials.gov with the registration number (NCT05100407).

Key findings: The study showed a very high prevalence of MDR (88%) and the prevalence of XDR reached (23%). Whereas PDR prevalence was 2%. Specifically, MRSA was detected in 73% of the total patients infected with staph. The prevalence of ESBLs reached 56% among the patients infected with Enterobacteria. Regarding carbapenem resistance (CR) was recorded in 25% of the patients infected with different kinds of bacteria. Only education level was significantly associated with the prevalence of MDR. Patients with (college /post-graduate) education were associated with a low incidence of MDR.

Conclusions A very high prevalence of multidrug resistance bacteria was noted in patients with a bacterial infection. Among all patients' characters, only higher education was associated with lower incidence.

Social/Clinical Pharmacy	**Drug Information Resources in Iraqi Community Pharmacies**

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Abstract

Objectives Drug information resources are the discovery, utilization, and management of information in medications usage. Despite the importance and the availability of diverse resources, little information is known about the types of resources commonly used by pharmacists in Iraq. The objectives of this study were to determine the type of drug information resources do the pharmacists used and the common drug information questions they faced during their work in community pharmacy.

Methods A cross-sectional descriptive study was conducted in different Iraqi provinces and online self-reported survey was administered via Google Form Software to convenience samples of graduated pharmacists who were working in a private community pharmacy and having at least one year of experience between February 27 and May 15, 2021.

Key findings The researchers received 201 usable surveys. British National Formulary was used by 47% of the surveyed pharmacists to find specific information, followed by "Pharmacotherapy(s) and Applied Therapeutics" (16.9% for both). On the other hand, internet was used by 93% of the surveyed pharmacists and Google search engine (65%) and Medscape application (62%) were frequently surfed to find specific drug information and 81% of pharmacists trusted in this information and passed them to consumers. Drug safety in pregnancy and lactation was among the most frequently received questions (60.7%).

Conclusions Pharmacists prefer to surf specific internet websites to collect specific information about medicines and they referred to pharmaceutical textbooks if available at their pharmacies to get such information. The pharmacists are more often accessed by consumers that follow pharmacists for drug related questions.

Social/Clinical Pharmacy	**The Role of Ferric Citrate in a Sample of Iraqi Patients on Hemodialysis and its Tolerability- A Randomized Controlled Clinical Trial**

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Abstract
Objectives Uncontrolled hyperphosphatemia is the main difficulty facing staff treating patients with end-stage renal disease on hemodialysis. Sevelamer and calcium-containing phosphate binder have been associated with cost burden and tissue calcification, respectively. Therefore, the current trial was targeted to investigate the efficacy and tolerability of a new phosphate binder, ferric citrate, in a sample of Iraqi patients with end-stage renal disease on hemodialysis.
Methods prospective, active-controlled, randomized study was carried out in Babylon governorate, at the dialysis center in Al-Imam Al-Sadiq hospital. Participants were allocated randomly into two groups, one using ferric citrate with a dose of 6 g/day and the other using calcium carbonate with a dose of 3 g/day for two months. Serum phosphate, serum calcium, and serum intact parathyroid hormone were analyzed as well as the primary cause, age, and gender were reported at the base line of the study. Furthermore, the tolerability variables, adherence and gastrointestinal side effects, were reported at the end of the trial.
Key findings A total of 50 patients completed the trial. The ferric citrate group exhibited a decline in serum phosphate and intact parathyroid hormone more than the calcium carbonate group (p 0.05). There was similarity in gastrointestinal side effects reporting in both groups, with a higher adherence rate seen in the ferric citrate group.
Conclusions The use of ferric citrate for two months was seen effectively control serum phosphate level and intact parathyroid hormone. In addition, the current phosphate binder, ferric citrate, was associated with more adherence than calcium carbonate with similar in gastrointestinal side effects. Ferric citrate may be suitable alternative as phosphate binder in Iraqi participants.

Social/Clinical Pharmacy	**A Cross-Sectional Survey of Iraqi Herbalist Practicing in the Middle Euphrates Area with a Recognition of their Knowledge, Practice and Attitude**

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Abstract

Objectives Traditional medicine still plays an important role in the Iraqi health care system. The folk medicine is practiced in this country by what is termed Attar (Herbalist) who's stores are spread in both, countryside and inner-cityaeras throughout the different governments of Iraq. Large proportion of population profoundly rely on Folk medicine to meet their health needs which makes their safety questionable. As herbalists contribute largely to public health, it is imperative to evaluate their practice and knowledge of herbal medicine to ensure safety of their clients which brings the importance of this study.

Methods A 54 herbalists were interviewed throughout the Middle Euphrates Area which was denoted by the five-governments including Karbala, Al-Najaf, Babylon,, Al-Muthanna and Al-Qadisiya, located in southern Iraq. The information regarding their practice, knowledge and attitude were collected through a cross sectional survey. The questionnaire contained mostly closed-ended questions of about 16 items, and it was divided into four segments including the demographic part. The data were statistically analyzed.

Key findings It was found that most of herbalist identify their herbal items using their own experience rather than references, as well as using this gained experience as their sole source of knowledge. Only few of them used herbal books in conjugation with their experiences. Herbalists with higher years of experience are those who evaluate patient condition properly and monitor their treatment progression as well as referring patients to their physicians when needed. It was also found that although most herbalist do educate their patients regarding expiration and storage condition of the given product, majority of them refrain from writing the full ingredients on their final prescribed remedy regardless of their years of experience. It was also observed that none of herbalist have a record to track adverse reaction from the herbal product given.

Conclusions This study recommends scheduling continuous education programs for herbalist to update their information, and practice especially in reporting unwanted side-effects of remedies sold in their shops, identification process of herbal items, focusing also on listing all active ingredients on the final package as well as expiration. This educational program should be a requirement to gain their license and to be renewed periodically, which ensures uniformity of their practice.

Social/Clinical Pharmacy	**Treating Herpes Labialis in Iraqi Females by Using Silicone Rubber Series with Aloe Vera Gel to Avoid Spreading the Disease and for An Esthetic Appearance: A Clinical Study**

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Abstract

Objectives Herpes simplex virus (HSV) infection is one of the most common and debilitating oral diseases; yet, there is no standard topical treatment to control it. The extract of Aloe Vera leaves has been previously reported to have anti-inflammatory, antibacterial, and also antiviral effects. There is simple data on the anti-Herpes simplex virus type 1 (HSV-1) activity of Aloe Vera gel. This study aimed to evaluate the anti-HSV-1 activity of Aloe Vera gel.

Methods The current study is a clinical study that had occurred from 18th November 2021 until 30th April 2022, The study sample is a simple random sample that included 15 patients in Baghdad, Iraq.

Key findings Patients who underwent Aloe Vera gel treatment after acyclovir and utilized temporary Sections with the goal of protecting others, The results showed that 0.2-3 percent Aloe Vera gel had a considerable inhibitory effect on HSV-1 development, suggesting that this gel could be a particularly effective topical treatment, When patients used the Sections before showering, they felt less soreness, Mothers stated that they would use parts when caring for their children and that they were 3 percent satisfied with the aesthetics of the face segments.

Conclusions The majority of herpes cases are caused by re-irritation of the latent virus, which was temporarily prevented by Temporary sections stops the spread of herpes labialis scabs, with a favorable aesthetic result. Finally, the findings revealed that 0.2-3 percent Aloe Vera gel had a considerable inhibitory effect on HSV-1 growth, suggesting that this gel could be a particularly effective topical treatment

Social/Clinical Pharmacy	**Determining the Prevalence of Urinary Tract Infection Pathogens and their Antibiotic Susceptibility Profile**

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Abstract

Objectives Urinary tract infection (UTI) is one of the most common bacterial diseases. Globally, 150 million people are diagnosed with UTIs annually, which cost more than 6 billion US dollars. UTIs are a spectrum of diseases ranging from simple cystitis to serious infections such as pyelonephritis and other complications in humans. The early treatment of UTIs with empiric antibiotics decreases the rate of morbidity. In order to administer an appropriate empiric therapy, it is critical to know the main bacteria causing UTI as well as their respective antimicrobial susceptibility pattern.

Methods This study is a descriptive quantitative retrospective study. Medical and lab records for 256 adult outpatients who visited Al-Diwaniya tertiary hospitals (Diwaniya Teaching Hospital and Gynecology Teaching Hospital) starting from Jan 2020 till Feb 2022 are reviewed and patients' sociodemographic (age, gender) and laboratory data (urine sample culture and antibiotic susceptibility test) are collected.

Key findings Data analysis revealed that most of the patients were females (204, 79.7%) with a mean age of 39.22±17.10. The prevalent uropathogen was Staphylococcus spp. (100, 39.1%) followed by E. coli (90, 35%) and Klebsiella spp. (23, 9%). Highest antibiotic sensitivity was found with linezolid (46, 100%), vancomycin (69, 90%), meropenem (84, 87%), amikacin (206, 72%) and nitrofurantoin (167,68%). Highest Bacterial resistance was for ampicillin (82, 94%), ofloxacin (94,78%), ceftriaxone (114, 76%), ciprofloxacin (208, 62%).

Social/Clinical Pharmacy	**Perceptions of Pharmacists Toward the New Iraqi Health Insurance Plan: A Qualitative Study**

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Abstract

Objectives Health insurance is defined as an insurance system which covers medical expenses. One of new challenges is implementation of Iraqi Health Insurance Law (IHIL) which has been approved recently. The aim of study was to explore pharmacist perceptions toward implementation and impact of new health insurance plan on Iraqi health system, providers and patients.

Methods This was a qualitative study. The study included face-to-face semi-structured interviews with experienced pharmacists working in public healthcare settings. The interview guide included open-ended questions covering the pharmacist perceptions about the impact on adopting the new health insurance plan on patients and healthcare providers at three levels: Quality of services, service cost and frequency of visits. Potential challenges were also discussed. The interviews were conducted at the public healthcare settings by one master student (pharmacist). The interviews were conducting during March through May 2022 at three provinces in southern Iraq: ThiQar, Wasit and Al-Muthana. Most interviews were audio-recorded to transcribe every word. Thematic analysis was used to analyze the interviews findings and generating themes and subthemes.

Key findings The study recruited 16 pharmacists till the saturation point has been reached. The following themes were emerged from the interviews. Most of the participants were aware of the new health insurance law. They all agreed that the law can enhance patient health. The participants believed that plan will bring positive financial income to healthcare providers in the private sector since the visits will be subsidized by the insurance authority. The pharmacists believed that patients will use private sector services more than the public sector because the private sector has shorter waiting time and better quality of service. They expected that health services will be improved. Adopting family doctor will enhance patient health because all the health information of each patient will be integrated at one physician. Additionally, the implementation of health insurance system will reduce the financial burden regarding the private sector fees. The potential challenges can face the plan included people resistance to pay monthly premium, the availability of current free public health services, inadequate expertise in management of financial bills, potential delay in the reimbursement of healthcare providers (HCPs), patient abuse/misuse of the insurance plan and absence of electronic system and database.

Conclusions The new health insurance plan has several potential advantages, but at the same time, it can face several technical challenges.

Social/Clinical Pharmacy	**Knowledge, Attitudes, Practices and Online Distance Learning Experience of Malaysian University Students towards COVID-19: A Cross Sectional Study**

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Abstract

Objectives Some new norms need to be adapted due to COVID-19 pandemic period where people need to wear masks, wash their hands frequently, maintain social distancing and avoid going out unless to buy the necessities. Therefore, educational institutions were closed to minimize the spread of COVID-19. As a result of this, online education was adapted to substitute the physical face-to-face learning. This study aimed to assess Malaysian university students' adaptation to the new norms, knowledge levels, attitudes, and practices toward COVID-19.

Methods A convenience sampling technique was used to recruit 500 Malaysian university students from January to February 2021 through social media. For data collection, all students were asked to fill in a questionnaire that was developed based on previous literature, using Google Forms.

Key findings 498 students completed the questionnaire (response rate 99.6%). Malaysian Ministry of Health (MOH) was the main source (83.73%) that students refer to when looking for information on COVID-19. Only 40% of the participants had good overall knowledge about COVID-19; such knowledge was influenced by the students' field of study. The current practice towards COVID-19 was good only by 26.1% of participating students; such practice was influenced by the ethnic groups. Additionally, 60% of participated students agreed that COVID-19 can be successfully controlled. About one-third of participants had positive attitudes toward online learning. The major challenges facing students during online learning include distraction of the learning environment (80%), unstable internet connectivity (75%), lack of motivation (70%), limited technical skills (41%), and limited broadband data (34%).

Conclusions The knowledge and practice toward COVID-19 was good in less than half of Malaysian university students. Attitudes to the controlling of COVID-19 were positive, while the attitudes toward online learning were neutral among most of the Malaysian university students. Challenges toward online learning are diverse and include both technical and student-related problems.

Social/Clinical Pharmacy	**Assessment of Iraqi Physicians Adherence to Medical Guidelines in Treatment of Different Diseases**

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Abstract

Objectives: Medical guidelines are defined as systematically developed statements to assist practitioners in making decisions on an appropriate health care for specific circumstances. The movement towards guidelines has been gaining ground quickly over the past years, as it is propelled by clinicians, legislators and organizations who are concerned about quality, consistency and costs. The aim of this study were to explore the adherence of Iraqi physicians to implement guidelines in treatment approach, to know which guideline was applied in the treatment approach of different diseases and to assess the extent of awareness of permanents, residents and clinical pharmacists about guidelines.

Methods: This qualitative research was done in public hospitals by interviews with different specialists (seniors), permanent, rotators and clinical pharmacists working in public healthcare settings.

Key findings: The result from this study was that there is no Iraqi guideline depended in public hospitals and the guidelines used by specialists were different according to their post graduations study and experience.

Conclusions: There is a need for the development of Iraqi guidelines for different diseases and to be obligatory to be followed in the health care settings

Pharmacognosy	***In Silico* Molecular Docking Studies of Medicinal Arabic Plant-Based Bioactive Compounds as a Promising Drug Candidate against COVID-19**

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Ghazi Ahmad Al Jabal, Department of Pharmaceutical Chemistry, School of Pharmaceutical Sciences, Universiti Sains Malaysia.

Abstract
Objectives COVID-19, a new strain of coronavirus (CoV), has affected more than 200 countries and received worldwide attention. Till now, there is no specific therapies or vaccines are available, and investigations concerning COVID-19 treatment are lacking. The aim behind our study is to evaluate the efficacy of several medicinal plant-based bioactive compounds against COVID-19 main protease, and these selected plants are frequently used in the Arabic area for treating viral infections, that might directly inhibit 2019 novel coronavirus.
Methods Docking analysis was used to test whether the compound has the potential for direct COVID-19 protein interaction. Molecular docking investigations were achieved using Autodock 4.2 to analyze the inhibition probability of these compounds against COVID-19. COVID-19 Mpro was docked with 36 compounds, and the binding energies were obtained from the docking of (PDB ID: 6LU7: Resolution 2.16 Å) with the native ligand (N3).
Key findings Betulinic acid (-10.0 Kcal/mol), Silibinin (-9.13 Kcal/mol), Oleanolic acid (-9.08 Kcal/mol) and epigallocatechin-3-gallate (-8.51 Kcal/mol), showed higher binding affinity to 6LU7 than N3 (-8.42 Kcal/mol), chloroquine (-7.12 Kcal/mol) and hydroxychloroquine (-7.35 Kcal/mol).
Conclusions Arabic herbals that classically used for treating viral infection, might contain compounds with potential therapy against COVID-19.

Pharmacology & Toxocology	**Vascular Biomarkers Study among Epileptic Patients with Monotherapy**

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Journal information: Biochemical and Cellular Archives, 2019

Abstract

Objectives Life-long treatment with Carbamazepine (CBZ) and Valproate (VAP) may change metabolic pathway by affecting the hepatic enzyme system leading to increase vascular and cardiovascular risk in epileptic patients. This study evaluated the effect of enzyme inducer CBZ, enzyme inhibitor VAP and non-enzyme inducer Lamotrigine (LTG) antiepileptic drugs on serologic biomarkers and evaluate effect of prolong duration of treatment with increasing vascular risk.

Methods Ninety epileptic patients who were receiving Anti-epileptic monotherapy including enzyme inducer CBZ, enzyme inhibitor VAP and non-enzyme inducer LTG for more than 2 years and 30 healthy individuals considered as control enrolled in this study. All subject information such as age, sex, Body mass index, duration of disease and treatment were recorded by using a questionnaire form. Laboratory investigations of serum FBS, UA, lipid profile, CRP and ESR were done to all participant in the study.

Key findings Prolong treatment with CBZ monotherapy associated with increased level of serum total cholesterol, LDL-C,CRP and ESR level with P-value< 0.001. While prolong treatment with VAP monotherapy associated with significant higher level of serum UA than the other groups with P-value< 0.001 and also increase level of CRP and ESR than LTG and control groups with P-value< 0.05 , in addition LTG increase level of serum UA than control with P-value< 0.05. Also regression analysis show weak positive correlation between duration of treatment and vascular biomarkers.

Conclusions Epileptic patients with CBZ and VAP exhibit alteration in vascular biomarkers that may associate with increased risk of cardiovascular disease, in addition increase duration of treatment may increase risk of atherosclerosis.

Medicinal Chemistry	**Synthesis and Preliminary Pharmacological Evaluation of Schiff Bases of N –Benzyl Isatin Derivatives**

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Journal information (if published)	Systematic Reviews in Pharmacy, 2020

Abstract

Objectives This work illustrates the synthesis of new isatin Schiff base compounds, to acquire and study the new pharmacological effects of them.

Methods First, isatin and its analogs 5- fluoroisatin and 5- methoxyisatin reacted to obtain N-benzylated derivatives. This is by isatin reaction with benzyl halide and reflux stirring to get N-benzylated derivatives; compounds 2(a-c). Second, to get Schiff bases compounds 3(a-c) and 4(a-c), the N-benzylated derivatives; compounds 2(a-c) react by reflux stirring with two different amines (sulphanilamide and 4-(methyl sulphonyl) aniline) using glacial acetic acid as a catalyst in ethanol will achieve it. All compounds characterized by using (FT-IR and 1HNMR) and this is acceptable with their chemical structures. The synthesized Schiff bases examined for in vitro anti-microbial activity using Gram-positive species of bacteria (*Staphylococcus aureus*, *Streptococcus pyogenes*, and *Enterococcus faecalis*) using Amoxicillin as a standard drug, while for three Gram-negative species of bacteria (*Klebsiella pneumoniae*, *Escherichia coli*, and *Pseudomonas aeruginosa*) use Ciprofloxacin as a standard drug. Finally, as a fungus; *Candida albicans*, Fluconazole used as an antifungal drug.

Key findings At the two concentrations used (1.6 and 5 mg / mL), all Schiff bases display no antifungal activity and *Klebsiella pneumonia* bacteria, moreover all compounds show no activity at the concentration (1.6 mg/mL), while most compounds show moderate antibacterial activity at concentration 5 mg/mL towards most bacteria. However, compounds 3b and 3c exhibit no activity toward all bacteria that examined.

Medicinal Chemistry	***In silico* virtual screening, docking, and ADMET prediction of potential HDAC8 inhibitors**

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Abstract

Objectives Histone acetylation is a highly interesting epigenetic target for drug therapy. Histone deacetylase enzymes (HDACs) are overexpressed in several diseases including, cancers. Most of the clinically used HDAC inhibitors involve the hydroxamate group as a zinc-binding group (ZBG). Hydroxamates have a poor pharmacokinetic and toxicity profile. Therefore, developing non-hydroximate HDAC inhibitors is a promising strategy for potency and selectivity enhancement. In this work, we implicated the in silico approaches to design HDAC inhibitors containing new ZBG moiety.

Methods We utilized Glide software (Schrodinger Inc.) to perform a high-throughput virtual screening (HTVS) of a Binding Data Bank (BDB) library that contains 22731 scaffolds of possible ZBGs into HDAC8 isoform. The best scoring 290 scaffolds containing heterocyclic or aliphatic ZBGs of a calculated binding affinity of (< -5 kcal/mole) were connected to the linker and cap groups. A standard precision (SP) docking experiment on HDAC8 enzyme was carried out, and the 30 molecules with the highest docking scores of (< 8.5 kcal/mole) were further studied using an extra precision (XP) mode on HDAC1, 2, 4, 6, and 8 to predict the selectivity profile through inspection the binding, fitness, and other parameters from the docking datasheet. For the 7 top molecules, ADMET property prediction was performed using QIKPROP to estimate the toxicity, absorption, distribution, blood-brain barrier penetration, polar surface area, and other pharmacokinetic properties. Compounds with excellent docking profiles and accepted ADMET results were selected for future experimental studies.

Pharmaceutics	**Innovated Formulation of Azithromycin Tablet as Inclusion Complex with *In vitro* Release and Stability Studies**

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Abstract

Objectives Azithromycin is a nitrogen-containing macrolide (azalide). It is antibacterial drug, given in the treatment of respiratory-tract infections (including otitis media), in skin and soft-tissue infections, and in uncomplicated genital infections. Usually, azithromycin is used orally as tablet with adult dose of 500mg (as di-hydrate salt). Azithromycin is characterized with poor solubility in water and consequently shows low dissolution and resulting low bioavailability value of tablet.

Methods In this work, azithromycin is formulated as inclusion complex with a solubilizing agent hydroxyl propyl beta-cyclodextrin and compressed as tablet by direct-compression which gave a higher rate of dissolution and different concentrations of the solubilizing agent were studied. The nature of drug in its inclusion complex was investigated by Infra-Red and DSC analysis for any changes might be occurred during the complexation process. The dissolution rate and the stability of Azithromycin was monitored by a developed HPLC method of analysis. The HPLC method was validated for precision, accuracy, reproducibility and specificity for determination of Azithromycin and detection of its degradation products.

Pharmaceutics	**The Effect of Formulation and Process Variables on Prepared Etoricoxib Nanosponges**

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Abstract

Objectives To assess the improvement in solubility and drug release using Nanosponges (NS) deliver system. ETX loaded NSs (ETX-NS) were prepared using the emulsion solvent diffusion method.

Methods The ratio of drug: polymer (1:0.25,1:1.5: 1:2 and 1:3) for formulas F1, F2, F3, and F4 respectively, the type and quantity of organic solvent used in the preparation, stirring rate, and sonication effects on the solubility, particle size, and entrapment efficiency and entrapment efficiency of prepared NS were investigated and evaluated.

Key findings The solubility of ETX was enhanced when formulated as EXT-Ns. The increase in EC proportion in EXT: EC ratio caused a decrease in solubility of prepared EXT-NS ($p<0.05$), while sonication increases the solubility of NS associated with a reduction in particle size at a constant ratio of EXT: EC (1:2). Increasing PVA content from 2gm (F3) to 3 gm (F3-B) caused a high increase in the solubility (2.704 mg/ml) of NS with a significant reduction in particle size (110 nm). Particle size results confirmed that prepared NS were in the nanosized range with a Polydispersity Index (PDI) of less than 1 (=0.005). The ratio of EXT: polymer, sonication, and PVA quantities variables have a significant effect on EXT-NS solubility, particle size, and %EE. Improved % EE (90%) and efficient reduction in particle size can be obtained by increasing the quantity of PVA in the formulation and using the suitable drug: polymer ratio and stirring speed during processing.

Pharmaceutics	**Preparation and *In-Vitro* Evaluation of Controlled Release Ion Sensetive Floating Oral *In Situ* Gel of Montelukast Sodium for Pediatric Patient**

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Abstract
Objectives The main purpose of this study was to develop an oral liquid preparation (floating oral in situ gel system) by using nontoxic, biocompatible and biodegradable gel forming ingredients for delivery of Montelukast Sodium that increase the convenience of administration and produce a correct therapeutic amount of drug, in addition to produce a sustained release of drug by increasing the residence time resulting in a controlled drug delivery in GIT.
Methods Montelukast Sodium in situ gels at different concentration (w/v) of Gellan gum, sodium alginate and Pectin were prepared and characterized in the terms of pH Measurement, drug content, In vitro Floating Study, In-vitro gelation study, viscosity and in vitro release study.
Key findings The drug content was found to be in the accepted range for all the formulations indicating uniform distribution of drug. The in vitro floating test revealed the ability of all formulae to maintain buoyant for more than 12 h. The viscosity of the formulations in solution increased with increasing concentrations of ion sensitive gel forming ingredients (Gellan gum, sodium alginate and pectin) and the concentration of gas generating agent (CaCO3). In vitro release study showed that the release of Montelukast Sodium from these gels was characterized by an initial phase of high release (burst effect) and translated to the second phase of moderate release.
Conclusions The prepared floating in situ gel of appears to be a promising as a stomach specific delivery system of montelukast sodium for better treatment.

Pharmaceutics	**Formulation variables effect on gelation temperature of Nefopam hydrochloride intranasal in situ gel**

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Abstract

Objectives Nefopam (N.F.) HCl is a non-narcotic centrally-acting, non-opioid benzoxazocine analgesic to relieve acute and chronic pain. It exhibits low bioavailability (about 36%) due to its first-pass degradation in the liver and shows several common side effects related to peripheral action of N.F. HCl, such anticholinergic side effects include urinary retention, dry mouth, and nausea. Intranasal administration has been used as a new route for targeting active brain sites and enhancing the bioavailability of N.F. HCl bypassing hepatic metabolism.

Methods In order to create an optimal intranasal formula, Preformulation studies were executed on N.F. HCl and excipients to be used as an in situ gel system. Preformulation studies include: Identification tests are carried out to ensure the purity of materials (drug and polymers), and Solubility study focusing on N.F. HCl solubility in Simulated nasal fluid, compatibility studies with the in situ gel polymers (FTIR), and an initial screening test on the preparation of the best combination of polymers for in situ gel administration of N.F. HCl. *In situ* gel of N.F. HCl was prepared by the cold method using different concentrations of Poloxamer 407 as thermosensitive polymer, Poloxamer 188 as gelling temperature modifier, and HPMC K4M, Carbapol 934, Hyaluronic acid, and Methylcellulose as a mucoadhesive polymer. The results show that identification tests are superimposed with references, solubility study shows that N.F. HCl is suitable to be administered intranasally; Compatability studies reveal incompatibility of Nefopam HCl with HPMC K4M and Carbapol 934; meanwhile, no interaction with Methylcellulose and Hyaluronic acid.

Conclusions The obtained results revealed the incredible ability of the produced N.F. HCl intranasal in situ gel is intended to enhance drug bioavailability bypassing the metabolizing effect of the liver that N.F. HCl is facing when given orally.

Pharmaceutics	**Preparation and Evaluation of Emulgel as Topical Drug Delivery for Nimesulide by Using Conventional Emulsion**

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Abstract

Objectives Topical drug administration is a mean by which various types of dosage forms such as ointments, creams, gels and emulgels are applied at a specific site of the body such as skin, ophthalmic, vagina and various parts of gastrointestinal tract to give either local or systemic effect. Nimesulide is non-steroidal anti-inflammatory drug (NSAID) which has good anti-inflammatory, analgesic and antipyretic activity. The study aims to prepare and evaluate nimesulide emulgel by using conventional emulsion.

Methods In this study, eight formulations of nimesulide emulgel containing conventional emulsion were prepared to investigate the effects of different variables on the physical appearance, pH, spreadability, viscosity and in vitro drug release. These variables are the type of oil phase of the emulsion (olive and coconut oil), type and concentration of emulsifying agent (span 80 and tween 80), type of gelling agent (carbopol934 and HPMCK15M), preservative and penetration enhancer.

Key findings The results revealed that (F4) which consist of 2.5% HPMCK15M, 4% (combination of span80 and tween80), 8% coconut oil and 1% nimesulide was an optimum formulation, since it shows maximum drug release after 7 hrs in addition to excellent physical appearance.

Clinical Biochemistry	**Proteomic Analysis of Stromal and Epithelial Cell Communications in Human Endometrial Cancer Using a Unique 3D Co-Culture Model**

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Abstract

Objectives Epithelial and stromal communications are essential for normal uterine functions and their dysregulation contributes to the pathogenesis of many diseases including infertility, endometriosis, and cancer. Although many studies have highlighted the advantages of culturing cells in 3D compared to the conventional 2D culture system, one of the major limitations of these systems is the lack of incorporation of cells from non-epithelial lineages. In an effort to develop a culture system incorporating both stromal and epithelial cells of human endometrial cancer tissue.

Methods A 3D endometrial cancer spheroids are developed by co-culturing endometrial stromal cells with cancerous epithelial cells. The spheroids developed by this method are phenotypically comparable to *in vivo* endometrial cancer tissue. Proteomic analysis of the co-culture spheroids comparable to human endometrial tissue revealed 591 common proteins and canonical pathways that are closely related to endometrium biology. To determine the feasibility of using this model for drug screening, the efficacy of tamoxifen and everolimus is tested. In summary, a unique 3D model system of human endometrial cancer is developed that will serve as the foundation for the further development of 3D culture systems incorporating different cell types of the human uterus for deciphering the contributions of non-epithelial cells present in cancer microenvironment.

Clinical Biochemistry	The Impact of Vitamin D Deficiency on Some Immunomodulatory Markers in Pregnant Women with Threatened Abortion

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Abstract
Objectives The protective mechanism of vitamin D (VD) on the immune system played an important role behind many health problems including abortion. Our aim was to investigate the levels of VD and some immunomodulatory markers (IL-6, TNF-α and INF-γ) in pregnant women with threatened abortion (TA) and their effects on their obstetric health.
Methods This study included 132 pregnant participants with TA visiting maternity hospital in Babylon province, Iraq. The demographic data including previous and current obstetrical history and body mass index were collected by well-trained researcher following structured questionnaire after obtaining their verbal consent. Laboratory Investigations were done with estimation of VD, IL-6, TNF-α and INF-γ.
Key findings The mean level of VD was 9.83±3.59 ng/ml, IL-6 was 289.45±70.88, TNF-α 8.78±4.11 and INF-γ and 2.39±2.13ng/ml with related percentage among participants for low VD was 84%, high IL-6 was 66%, high TNF-α was in 43% but only 23% had high INF-γ. The frequency of abortion was significantly increased with low VD and high IL-6 ($p<0.05$) with high correlation between them ($r2=0.89$). Conclusions: High incidence of TA associated with low VD accompanied with high serum levels of IL-6. This adverse pregnancy outcome may be associated with some form of autoimmune diseases and the role of VD to correct the immunomodulatory markers specially IL-6 that hypovitaminosis D was correlated with high proinflammatory markers and worse form of TA.

Pharmaceutics	**Preparation and *In-vitro* Evaluation of Darifenacin HBr as Nanoparticles Prepared as Nanosuspension**

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Abstract

Objectives: After intravenous and immediate-release oral dose forms, Darfenacin suffers from extensive first-pass metabolism with a short elimination half-life and ranging between three to four hours). The current research focused on creating an extended-release dosage form utilizing Eudragit RS100.

Method: Solvent/anti-solvent precipitation method was used to make Darifenacine nanoparticles. A certain quantity of medication was dissolved in water miscible solvent (methanol), then poured at a specific speed into water containing stabilizer on a magnetic stirrer for half hour, after that the resulted product sonicated at 37°C for 5 minutes. The physicochemical interaction among medication with additives was explored utilizing F.T.I.R and D.S.C, and the particle size as well as zeta potential of the generated nanosuspension was calculated. Nine formulas were prepared (F1-F9) by using dissimilar stabilizers

Key findings This study confirms that the antisolvent technique is suitable for the preparation of darifenacin nanoparticles with sustained release efficiency. This formulation approach can be used to improve the therapeutic efficacy of poorly soluble drugs. The changes in nanoparticle size were affected by changes in polymer concentration. The formula F4 has the best characteristic and suitable for formulation as nanosuspension for sustained release formula.