RESEARCH REPORT

21-22
PRESIDENT’S MESSAGE

Beirut Arab University has always been true to its mission as a beacon of knowledge and academia in Lebanon and the region. It was also our mission for the past few years to support and achieve research excellence and to prepare our researchers to lead the way in different research fields and disciplines.

BAU has established and still adopts four main research themes with specified subthemes that are recognized and adopted across the Faculties. These themes are aligned with the United Nations Sustainable Development Goals (SDGs) and they govern BAU’s research production which helps enhance BAU’s visibility, collaboration opportunities and partnerships. This was translated into BAU’s scores in the Times Higher Education (THE) Impact Rankings for the year 2022 where BAU ranked 3rd in Lebanon in its first year of participating and also ranked first in Lebanon on SDG 4, Quality Education. BAU also ranked third in Lebanon in THE World University Rankings for the year 2023, and first in Lebanon and eleventh in the Arab world according to THE Arab University Rankings for the year 2022.

Our University has also become a place to stimulate creativity and collaboration, as well as to nurture innovative ideas. Through collaboration with other Universities, local and international, government and industrial stakeholders, we, at BAU, are making momentous enhancements to fundamental knowledge and understanding in different research areas. We strive on serving our community and pursuing relevant and contemporary research ideas and topics. We maintain our agreements and collaborations with our research partners and grant and funding bodies to better serve the community and to support and motivate research production. Despite the circumstances governing the situation in Lebanon, whether the onset of the COVID-19 pandemic or the economic situation with the downfall of the value of the Lebanese Pound in reference to the U.S. Dollar, our researchers remained keen on producing quality publications in the best journals.

Beirut Arab University has always sought research and academic excellence and continues to strive to prepare researchers to lead the way in the different research areas. BAU remains a repository for the transfer of knowledge, technology and expertise. The research environment at BAU fosters innovation and endorses our researchers’ vision to seek new territories and be leaders in their respective fields, despite the challenges and obstacles they may face.

Prof. Amr Galal El Adawi
President of Beirut Arab University
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INTRODUCTION

BAU offers a rich research environment that encourages students and Faculty members to tackle innovative research topics, with special attention to research that serves the community. Our researchers embark on topics from multiple disciplines and target projects locally and globally with a vision to create impactful and positive change.

Research at BAU is guided by research themes and subthemes which govern and provide a roadmap for research projects conducted by students and Faculty members to be in line with BAU Research Strategy as well as allow for research collaborations and partnerships.

BAU also values the relationships with funding agencies and the importance of obtaining research funding and grants. Accordingly, our University maintains its relationship with the National Council for Scientific Research (CNRS) to fund projects locally. Intramural grants and grants from Funding bodies outside Lebanon are also always a target for our Faculty members to obtain funding in support of our vision for the advancement of research.

Our University has always strived to become a leader in experiential learning to support opportunities for all of our students to work in different research fields. We have also worked hard on improving the quality and quantity of our research and aligning it with our academic programs. Thus, we have endorsed the importance of research activity in the learning process as well as in the advancement of the academic mission of our Faculty members. Our mission to deliver practical and innovative research opportunities is a process that hinges on the talent and dedication of our professors, administrators and students working on projects in all of our Faculties. Together, we work to become leaders in our research fields of expertise with the determination to better serve our community.

BAU remains strong on its direction towards targeting highly-ranked journals to publish research work with emphasis on quality of research work over quantity. Our steady progress towards becoming a unique research-driven teaching university wasn’t shaken by the onset of the COVID-19 pandemic nor the downfall of the Lebanese economy. Our Faculty members remained persistent on delivering quality research despite the challenges they faced due to lockdowns and issues with funding. They also tackled relevant and contemporary topics, particularly research projects on the pressing and present issue of the coronavirus pandemic.

This annual report documents the research outcome of our Faculty members throughout the academic year 2021-2022, the year of rising up to challenges.
At BAU, we have identified four thematic research areas that guide our research and help us bring our expertise to pursue the answers of key questions of our age in the fields of Science, Art and Social Sciences.

To choose our research themes we have examined the national and international research strategies, we have used advanced bibliometric tools, and we have sought the opinions of international thought leaders.

Our four research themes motivate our researchers to explore new ideas, challenge opinions, inquire, create and disseminate new knowledge to be placed at the service of Lebanon and the world. Each Faculty at BAU has also identified its own subthemes which pinpoint the specific research direction and interests of each Faculty as shown in the tables below. We place great importance on giving our students numerous opportunities to study with our researchers and to develop their own research careers and guide them to conduct community-based research.
<table>
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<th>Science and Technology</th>
<th>Society, Culture and Human Behavior</th>
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| **Faculty of Human Sciences** | - Impact of Communication Technology on Social Relationships  
- Library Information Systems  
- Record Management Systems  
- Digital Repository  
- Web 2 Application in Libraries |
| **Faculty of Law & Political Science** | - Informatics Crimes  
- E-transactions + E-Banking  
- E-Procedures (E-Arbitration, Mechanization of Procedures)  
- Information and Communication Technology in Business |
| **Faculty of Business Administration** | - Information and Communication Technology in Business  
| **Faculty of Architecture – Design & Built Environment** | - Digital Technology in Architecture  
| **Faculty of Engineering** | - Construction, Planning, and Design  
- Energy and Environment  
- Applied Mathematics and Computational Sciences  
- Materials Engineering  
- Advances in Technology  
- Simulation, Modeling and Design  
| **Faculty of Science** | - Mathematical and Computational Science  
- Advanced Materials  
- Environmental Studies  
- Software and Computing  
| **Faculty of Pharmacy** | - Drug Delivery and Development  
| **Faculty of Medicine** | - Digital Technology in Healthcare  
| **Faculty of Dentistry** | - Laser Application in Dentistry  
- Towards Digital Dentistry  
- Regenerative Endodontics  
| **Faculty of Health Sciences** | - Food Technology and Processing  
- Personality and Behavior  
- History and Heritage  
- Language and Literature  
- Information Literacy  
- Media  
- Societal Change  
- Corporate Social Responsibility (in the Scope of Recent Development in the Corporate Law)  
- Social Justice between Constitutional Text and Application  
- The Effect of Economic Changes on the Criminal Behavior  
- Recent Developments in the Civil and Criminal Procedures and Accomplished Justice  
- Development, International Crisis and the Contemporary Politics in the International Public Law (Human Rights, Criminal, Environmental, Economic and Financial), in the International Relations and in the State  
- Human Behavior in Organizations  
- Theories, History, and Humanities in Architecture  
- Advanced and Alternative Medicine  
- Healthcare Jurisdictions and Policies  
- Healthy Lifestyles in Individuals and Community  
- Preventive and Community Dentistry  
- Child Management
### TABLE 1
Research Output for the Academic Year 2021-2022 Classified According to Type of Publication

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<thead>
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### TABLE 2
Publications for the Academic Year 2021-2022 Classified According to Journal Ranking and Indexing

<table>
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*APJ Architecture & Planning Journal
**BAU Journal-Journal of Legal Studies
BAU Journal-Health & Wellbeing
BAU Journal-Science & Technology
BAU Journal-Society, Culture & Human Behavior
BAU Journal-Creative Sustainable Development
### I. PUBLICATIONS

**ARTICLES**

<table>
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<tr>
<th>Author(S)</th>
<th>Article Title</th>
<th>Journal</th>
<th>Year</th>
<th>Publication Info</th>
<th>Theme / Subtheme</th>
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**ABSTRACT**

**Background**
The Eight-item Fear Scale is a unidimensional scale evaluating the perceived feelings of fear associated with the thought of the coronavirus.

**Aim**
The Arabic version of this scale did not exist; hence, this study aimed to translate and evaluate the psychometric properties of the Fear Scale in participants aged 18 years and above in five Arabic countries: Egypt, Lebanon, Libya, Saudi Arabia, and Sudan by using a cross-sectional survey design.

**Method**
The English version of the COVID19- Fear Scale was translated into Arabic following the guidelines and disseminated through social media. Factorial and convergent validity and internal reliability were evaluated.

**Results**
The total number of participants was 2783; the majority was young (%41.9) and female (%60.5). Fear scores were moderate in four countries and severe in Egypt. The scale showed good structural validity, with the items explaining up to %70 of the variance. The scale items correlated significantly with the total scores, and the Cronbach alpha was above 0.9.

**Conclusion**
The study concluded that the Arabic Fear Scale is a psychometrically robust scale that can be used to evaluate the perceived feelings of fear with the thought of the coronavirus or pandemic in general.
An Examination of Culture and Gender Differences on the Love of Life Scale (LLS) and Its Psychometric Properties

ARTICLE TITLE

Mental Health, Religion and Culture

YEAR

2022

PUBLICATION INFO

DOI: 10.1080/13674676.2022.2034772

THEME / SUBTHEME

Health and Wellbeing/ Personality and Well-being

ABSTRACT

The present research studied 2570 college students from seven countries: Egypt, Algeria, Kuwait, Lebanon, Iran, India and Turkey. The aims were: (a) to compare love of life mean scores between the seven samples, (b) to examine sex-related differences in love of life, and (c) to explore the principal components of the Love of Life Scale (LLS). The highest mean total LLS scores were for Kuwait, India, and Iran students, respectively. All countries differed significantly from one another, except Algeria versus Lebanon and India versus Iran. Higher mean LLS scores for women were found for each country. Cronbach alpha for the LLS was .93. A principal component analysis extracted from one to four components for individual countries, but one component was extracted for the total sample and labelled: Positive attitude towards life and Meaningfulness of life. The love of Life concept may be considered to be an important concept in positive psychology.

Are Nonfatal Suicide Attempts Instrumental in Achieving Personal and Interpersonal Goals?

ARTICLE TITLE

Behavior Therapy

YEAR

2022

PUBLICATION INFO

53(4): 725-737

THEME / SUBTHEME

Health and Wellbeing/ Personality and Well-being

ABSTRACT

This study focused on the well-being of the survivors of suicide attempts and the well-being of their interpersonal relationships after the attempt. The data came from a sample of 392 college students from 10 Muslim majority countries who reported having attempted suicide in the last 4 years. Suicide was conceptualized as a goal-directed behavior embedded in a socio-cultural context and motivated by personal or interpersonal goals. We tested a process that linked culturally shaped self-construal to the postsuicidal personal and interpersonal well-being. We posited that this process would operate through the attitudes towards suicide, motives for suicide, the strength of the intention to die. Our model indicated that the acceptability of suicide was positively associated with escape motives, and this association was even stronger for the individuals with interdependent self-construals. Escape motives were negatively associated with postsuicidal personal and interpersonal well-being, but communication motives were not associated with these outcomes. We also found evidence that having an interdependent self-construal might be beneficial for postsuicidal personal and interpersonal well-being. Our results further suggested that the postsuicidal personal and interpersonal well-being of highly interdependent individuals may depend on the interpretation of their act of suicide by their close others.
​
ABSTRACT

The theme of forced alienation and the challenges of survival in the poetry of Mahmud Darwish is examined in this article. The poet’s work is studied in the context of Arab society, culture, and human behavior, and an analysis of his work in relation to a literary trend in Arabic poetry. The article discusses the poet’s depiction of the experiences of forced alienation and how they are reflected in his poetry. The poet’s use of metaphor and symbolism in his work is also analyzed, along with the implications of his poetry for contemporary issues in Arab society. The article concludes with a discussion of the importance of understanding the poet’s work in the context of the larger cultural and political landscape of the Middle East.
دراسة مقارنة في الصمود النفسي لدى اللاجئين في المخيمات الفلسطينية والسورية واللبنانيين في لبنان

Journal of the Association of Arab Universities for Researchers of Higher Education

2021

41(4): 17-30

Society, Culture and Human Behavior/ Personality and Behavior

هدفت هذه الدراسة إلى تحديد الفروق في الصمود النفسي لدى اللاجئين في المخيمات (فلسطين، سوريا، لبنان) فرداً من فلسطين، سوريا، لبنان، وبلغ تعداد عينتة المبلغ (375). وتم استخدام مقياس الصمود النسبي ك חוافض وسيرة شخصية، وتم تطبيق مقياس الصمود النسبي على عينة اللاجئين، وتم حساب متغيرات الصمود النسبي، وتم استخدام اختبارات نجح وثبات معاملات التحليل الإحصائي. و resultado هذه الدراسة، أن اللاجئين في المخيمات النسبي والحاجة إلى الدعم المالي، والاهتمام بالصحة والتعليم، وتعزيز الثقة بالنفس، وتشجيع القدرات الشخصية للتعامل مع التحديات، وتعزيز المهارات الاجتماعية والتعليمية، وتعزيز الممارسة البدنية والصحية، وتعزيز العلاقات الاجتماعية، وتعزيز المعرفة والوعي الاجتماعي، وتعزيز الوعي القانوني، وتعزيز الممارسة الديموقراطية، وتعزيز الوعي السياسي، وتعزيز الوعي النسوي، وتعزيز الوعي البيئي، وتعزيز الوعي الطبقي، وتعزيز الوعي العالمي، وتعزيز الوعي الثقافي، وتعزيز الوعي الفني، وتعزيز الوعي الديني، وتعزيز الوعي الاجتماعي، وتعزيز الوعي الديموقراطي، وتعزيز الوعي القانوني، وتعزيز الوعي الطبقي، وتعزيز الوعي العالمي، وتعزيز الوعي الثقافي، وتعزيز الوعي الفني، وتعزيز الوعي الديني، وتعزيز الوعي الاجتماعي، وتعزيز الوعي الديموقراطي، وتعزيز الوعي القانوني، وتعزيز الوعي الطبقي، وتعزيز الوعي العالمي، وتعزيز الوعي الثقافي، وتعزيز الوعي الفني، وتعزيز الوعي الديني، وتعزيز الوعي الاجتماعي، وتعزيز الوعي الديموقراطي.
الإطار القانوني للعدالة الانتقالية في تونس وسوريا

مجلة القانون الدستوري في الشرق الأوسط وشمال أفريقيا بالتعاون مع برنامج سيادة القانون في الشرق الأوسط وشمال أفريقيا التابع لمنظمة كونراد أديناور الألمانية

2021

2(2): 117-140

Society, Culture and Human Behavior/ Recent Developments in the Civil and Criminal Procedures and Accolished Justice

إن كل مجتمع يخرج من حالة صراع واقتتال يحتاج إلى مرحلة انتقالية لمعالجة آثار الماضي وتحقيق مسار جديد للدولة. وذلك فالعدالة الانتقالية هي وسيلة من وسائل نزعات الإرتكابات الداخلية لبناء الدولة على أسس صحيحة. إن نشأة العدالة الانتقالية تقوم على مفهوم رئيس أساقفة جنوب أفريقيا ديزموند توتو الذي يقول: "كيف نحول الأخطاء، "العدالة الانتقالية" هي القاعدة السماوية لعملية التحول، فالعدالة الانتقالية هي الفكرة الأساسية لعملية التحول، وهي القاعدة السماوية لعملية تحقيق السلام.

إنطلاقاً من هنا، تتمحور الأسئلة الرئيسية في دراستنا هذه حول دور العدالة الانتقالية في إقامة المؤسسات الدستورية وال-democracy في ظل ما يشهده العالم من إشكالات كالمواطنية والإفراط في حقوق الإنسان، ونماذج الديمقراطية، هل تستطيع العدالة الانتقالية في تحقيق أهدافها؟ وكنما نشأت الإشكالية الرئيسية في ها هذه دراسة هي انعكاسات التحول الديمقراطية في المجتمع السلطي إلى المجتمع الديمقراطي وهذا ما يوجهنا على دفع هذه الدراسة وفقاً للفهم الآتي:

المطلب الأول: النظام القانوني للعدالة الانتقالية

المطلب الثاني: العدالة الانتقالية بين الضوابط والتطبيق

* Names in Bold Indicate BAU Authors
الإطار الموضوعي للحالات المشتركة الجنائية (دراسة مقارنة)

**_ABSTRACT_**

يمكن التمييز بين عدد من الأشخاص الذين تسجلهم حكمة المتهمين، عملاً إذا كان هذا النوع يخلق سوء الأثر أو التأثير في القانون، أو إذا كان موضوع الطلب أو السبب للمتضرر. وتلك هذه الأحكام في حالة الدفاع بالمضمون، يجب الاستماع للمسائلة السجدة في صالح المصلحة مثل تعيين العاملين المشاركين في الاستماع، وقد تكون العاملين المشاركين في الاستماع، وقد تكون عاملين المشاركين في الاستماع، وقد تكون عاملين المشاركين في الاستماع.

**THEME / SUBTHEME**

Society, Culture and Human Behavior/ Recent Developments in the Civil and Criminal Procedures and Accumulated Justice

**JOURNAL**

BAU Journal-Journal of Legal Studies

**YEAR**

2022

**PUBLICATION INFO**

2021: 51-100

**ARTICLE TITLE**

الإطار الموضوعي للحالات المشتركة الجنائية (دراسة مقارنة)

مجملة الحالة النيابية التي يصدرها مجلس النواب اللبناني

**ABSTRACT**

يشكل الفساد خطراً على المجتمعات وإسقافها وأمنها، فهو يقوّض الديمقراطية وبدأ سياسته الفاسدة، ويسمح بإزدهار الجريمة المنظمة والإرهاب، ويؤدي إلی تحويل الأموال المخصصة للتنمية، ويؤثر على قدرة الحكومة في تقديم الخدمات الأساسية، ويكون في مؤشرات الاقتصاد، ويبدأ سياسته الفاسدة في طريق التنمية المستدامة.

**THEME / SUBTHEME**

Society, Culture and Human Behavior/ Recent Developments in the Civil and Criminal Procedures and Accumulated Justice

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الملاحظة النبوية لمكافحة الفساد (دراسة حول الاستراتيجية الوطنية لمكافحة الفساد واستراتيجية النهوض المالي والاقتصادي)

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جرائم الاحتكار في الظروف الاستثنائية (لبنان نموذجاً)

المجلة الحقوق والعلوم السياسية الصادرة عن الجامعة اللبنانية

2022

36: 217-249

Society, Culture and Human Behavior/ Development, International Crisis and the Contemporary Politic in the International Public Law (Human Rights, Criminal, Environmental, Economic and Financial), in the International Relations and in the State

لا تعد الإحتكار فرعاً من فروع الجرائم الاقتصادية التي نتناولها التشريعات الوطنية والدولية، وإن كانت من مناطق التشريعات المختلفة من خلال تخصيصها في القانون الدولي الخاص. يُعده الإحتكار فرعاً من فروع الجرائم الاقتصادية التي نتناولها التشريعات الوطنية والدولية، والوقائع المدنية. وقد عانى لبنان مؤخراً من العديد من التحديات السياسية والاجتماعية الأمنية الصحية، التي ساهمت في تقويض استقراره، وقد أدت لإثارة أزمات إقتصادية ومالية حادة. وبالإضافة إلى هذه التحديات، فقد دارت الاضرابات في الأسواق، وذلك على الرغم من الطابع الاقتصادي الذي يرتديه الإحتكار، إلا أن آثاره تشكل إنتهاكاً حاداً لحقوق الإنسان المحمية بموجب الدستور والمواثيق الدولية لحقوق الإنسان، لا سيما وأن الظروف الاستثنائية الراهنة قد أدى إلى خروج الإحتكار من المفهوم التقليدي القائم على المنافسة أو محاوله السيطرة على السوق لجذب المزيد الأرباح، إلى مفهوم أوساط نطاقاً يتضمن المسائل الأساسية للإنسانية.

نصفي الجرائم الدولية: جرائم ضد الإنسانية وجرائم الحرب في نظام المحكمة الجنائية الدولية (نظام روما)

المجلة الدولية للفقه والقضاء والتشريع

2022

3(1): 32-64

Society, Culture and Human Behavior/ Recent Developments in the Civil and Criminal Procedures and Accomplished Justice

إن الجرم الدولي: هي الجرمة التي ينص عليها القانون الدولي، باعتباره جرمة ذات عنصر دولي، واقعة ضد النظم العام الدولي، وتعتبر السلم والنظام والحقوق الأساسية للمجتمع الإنساني للخطر؛ ولهها ثلاث مكونات مدنية، ودولي، ومحكم.

أولاً: الوجه المعنوي: وهو صدور السلوك.

ثانياً: الوجه مادي: وهو سلوك ترتب عليه نتيجة إجرامية.

ثالثاً: الوجه الدولي: الذي يتطلب أن يكون الفعل المرتكب بناءً على طلب الدولة أو تشجيعها أو رضاها وتمشياً على أساس المجتمع الدولي، ونصوص الدستور والقوانين، وليست موقفاً عقلياً، وإنما فاعلاً عسكرياً، يهدف إلى تحقيق واقع مادي أو سياسياً.

إن الجرائم ضد الإنسانية: هي الجرائم التي يعن بها القانون الدولي، باعتباره جرمة ذات عنصر دولي، واقعة ضد عديد من السكان المدنيين في إطار هجوم واسع النطاق ومتكرر، يعبر عن نهج سلوكياً من قبل دول أو منظمات أو أفراد تقضي بارتكاب هذا الهجوم أو تعززاً لهذه السياسة، ويمكن تحديد الجرائم ضد الإنسانية عموماً من نظرة وحيدة، لذا لا تتشابه في كل الأحوال، ولكنها تشكل جرائم معينة في النظرة الدولية، وهي تشكل جرائم معينة في النظرة الدولية، وهي تشكل جرائم معينة في النظرة الدولية.

إن الجرائم في العصر الحديث، وتهيمن عليه، في العالم الدولي، هي جرائم ضد الإنسانية وجرائم الحرب، وهما جرائم تتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بالدولة واللا عضوية، وتمتد في جميع أنحاء العالم، وتعتبر جرائم عوامل، وتتعلق بال descargar de Google Drive.
تُعده ظاهرة التحول الجنسي ورفق العذري مظهراً من الظواهر التي تناولتها القوانين على إلهام، فقلمنا نجد تنظيم قانونياً يحدد إطاره بصورة صريحة وواضحة، وينظم إجراء العمليات الجراحية المرتبطة به.

وحيث أن هذه الظواهر تعتبجر الجسد محلاً لها، فقد ربطها بالجرائم المرتكبة على جسم الإنسان، وبالتالي، فإن المصلحة في إجراءها هي التي تحدد إباحتها أو تجريمها، فإذا كان الغرض من إجرائها علاجياً ومرتبطاً بالحالات النفسية، فهناك القوانين تسمح بذلك في الدواء والعلاج، ومكافحة إجرائها.

أما فيما يتعلق بالإجراءات الجراحية فهي تُعد مؤثرة عمليّاً كما هو الحال في الظاهرة التي تنطوي على التحول الجنسي. وقد اختلفت القوانين في التعامل مع هذه الظاهرة بتنوع الجهود وهو الحال إذا سقط في-active

وهو الحال إذا سقط في-active

الحالة العقلية في النهاية، هم القوانين في الطبيعة والعلاج، وتدعم ذلك التمييز في الحق في الحرية، ومع تدخل القانون على تدخينها، وأيام الثلاجة أو الثلاجة.

ومن خلال ما قصدناه من التجربة، فإن القوانين الدينية تحدد إجراءات المحميات الفردية في ظل استقلالها عن القانون.

ملخص الرأي القانوني

هل يختلف إجراهم الرجل عن إجراهم المرأة؟

طول البحث يختلف إجراء الرجل عن إجراهم المرأة. فقد أثبتت الإحصاءات الجريمة هذه الحقيقة، إذ تشير إلى أن هناك في الرجال أكثر في النساء، ولكن هذا ينعدد في العملاء، فقد ثبت أن الجريمة الخطيرة تتم في الجرائم المثلية، ولا ينعدد في الجرائم المثلية.

ومع ذلك، فإن القوانين تختلف في تعاملها مع الجرائم المثلية بشكل كبير. في بعض الأحيان، تتمقابل للمجلة أو المجلة، وتترواح في المجلة أو المجلة، وتعتبر القوانين في الجرائم المثلية في ظل الاستقلال.

ولكن، ما هو الخطاب القانوني المألوف من خلال هذا الكتاب؟

الطلب القانوني

هل يمكن أن يكون رجل أو امرأة؟ إذا الجزء المتعلق بالمرأة في المجتمع، فإنه يحقق للمرأة على مستوى العناصر، ومما ينعدد في الكتاب.

إذا الجزء المتعلق بالمرأة في المجتمع، فإنه يحقق للمرأة على مستوى العناصر، ومما ينعدد في الكتاب.

ومن خلال ما قصدناه من التجربة، فإن القوانين الدينية تحدد إجراءات المحميات الفردية في ظل استقلالها عن القانون، إذا كانت الجماعة أو بعض değişikliklerin genel kabul ettiği gibi.
### ARTICLE TITLE


### JOURNAL

EuroMed Journal of Business

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DOI: 10.1108/EMJB-11-2021-0168

### THEME / SUBTHEME

Society, Culture and Human Behavior/ Human Behavior in Organizations

### ABSTRACT

The purpose of this paper is to propose a new conceptual framework for big data analytics (BDA) in the healthcare sector for the European Mediterranean region. The objective of this new conceptual framework is to improve the health conditions in a dynamic region characterized by the appearance of new diseases.

**Design/Methodology/Approach**

This study presents a new conceptual framework that could be employed in the European Mediterranean healthcare sector. Practically, this study can enhance medical services, taking smart decisions based on accurate data for healthcare and, finally, reducing the medical treatment costs, thanks to data quality control.

**Findings**

This research proposes a new conceptual framework for BDA in the healthcare sector that could be integrated in the European Mediterranean region. This framework introduces the big data quality (BDQ) module to filter and clean data that are provided from different European data sources. The BDQ module acts in a loop mode where bad data are redirected to their data source (e.g. European Centre for Disease Prevention and Control, university hospitals) to be corrected to improve the overall data quality in the proposed framework. Finally, clean data are directed to the BDA to take quick efficient decisions involving all the concerned stakeholders.

**Practical Implications**

This study proposes a new conceptual framework for executives in the healthcare sector to improve the decision-making process, decrease operational costs, enhance management performance and save human lives.

**Originality/Value**

This study focused on big data management and BDQ in the European Mediterranean healthcare sector as a broadly considered fundamental condition for the quality of medical services and conditions.

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### I. PUBLICATIONS

#### ARTICLES

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>El Samad M., El Nemar S., Sakka G., El-Chaarani H.</th>
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<tr>
<td>JOURNAL</td>
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* Names in Bold Indicate BAU Authors
| JOURNAL | BAU Journal-Society, Culture and Human Behavior |
| YEAR | 2021 |
| PUBLICATION INFO | 2(2): 1-20 |
| THEME / SUBTHEME | Society, Culture and Human Behavior/ Human Behavior in Organizations |
| ABSTRACT | The objective of this study is to investigate the determinants (company specific characteristics and corporate governance factors) of audit report lag (ARL) in a developing country, namely, Lebanon. This paper adds and contributes to the limited literature that investigated the determinants of ARL in the developing Middle East countries through focusing on the Lebanese context. The study is carried out depending on a sample of Lebanese commercial banks operating in Lebanon, covering the period from 2012 to 2017. The researchers used the multiple regression analysis to examine the impact of the explanatory variables on ARL. The results show a significant relationship between ARL and each of bank size, leverage, board independence, board diligence, audit committee (AC) independence, and AC diligence. The regression outcomes reveal that banks with longer ARL are smaller, have higher leverage, their boards and ACs are less diligence, their boards are more independent, and their ACs include less independent and non-executive members. |

| ARTICLE TITLE | COVID-19 and Lack of Socialization: Does Service Innovation Become an Imperative for Universities? |
| JOURNAL | International Journal of Disruptive Innovation in Government |
| YEAR | 2021 |
| PUBLICATION INFO | 1(2): 82-103 |
| THEME / SUBTHEME | Society, Culture and Human Behavior/ Human Behavior in Organizations |
| ABSTRACT | Purpose This paper aims to examine the moderated mediation effect of the lack of students’ socialization (as one of the COVID-19 consequences) and the university reputation on the relationship between the service innovation and students satisfaction. The relationship between students satisfaction and their loyalty is also examined. Design/Methodology/Approach This study adopts a quantitative research approach, whereas the study population consists of all universities’ students in Lebanon. Data were collected from 201 students, elected depending on snowballing sample technique. A questionnaire was used to gather data, whereby partial least squares structural equation modeling was used to check the proposed scales validity and the relationships between the study variables. Findings The findings reveal a significant direct effect for university’s service innovation on students satisfaction and an indirect effect through the mediation role for university reputation. Moreover, an evidence for weak negative significant effect for lack of socialization on students satisfaction exists. Whereby, lack of socialization does not moderate the relationship between university service innovation and students satisfaction. Finally, students satisfaction has a significant positive effect on their loyalty. Originality/Value This paper advances the service innovation literature in the higher education sector. In addition, the paper might be the first paper to address the influence of lack of socialization as one of the COVID-19 consequences on students satisfaction. Furthermore, areas for future research are suggested. |
**ARTICLE TITLE**
Customers Loyalty: Does Value Co-creation Become Indispensable for Universities?

**JOURNAL**
BAU Journal-Creative Sustainable Development

**YEAR**
2021

**PUBLICATION INFO**
3(1): 1-18

**THEME / SUBTHEME**
Society, Culture and Human Behavior/ Human Behavior in Organizations

**ABSTRACT**
This paper investigates the direct and indirect relationships between customers’ participation in value co-creation activities (CPVCA) and their loyalty. Quantitative research approach is adopted, while the population consists of all the Lebanese private universities’ students. A questionnaire was used to collect data from 403 students, nominated according to convenience sampling technique. The study proposed scale validity and the relationships between variables were examined depending on PLS-SEM. The findings reveal a direct significant relationship between CPVCA and customers’ loyalty; in addition, to indirect relationship, through the partial mediating role for customers’ satisfaction and relationship strength. Research implications and limitations are presented.

**ARTICLE TITLE**
Determinant Factors of Successful Social Entrepreneurship in the Emerging Circular Economy of Lebanon: Exploring the Moderating Role of NGOs

**JOURNAL**
Journal of Entrepreneurship in Emerging Economies

**YEAR**
2021

**PUBLICATION INFO**
DOI: 10.1108/JEEE-08-2021-0323

**THEME / SUBTHEME**
Society, Culture and Human Behavior/ Human Behavior in Organizations

**ABSTRACT**
Purpose
Social entrepreneurship is gradually becoming a potent driving force for economic and social development in developing countries as a result of governance deficits. The purpose of this study is to examine the determinant factors of successful social entrepreneurship in the emerging circular economy of Lebanon. The objective extends to exploring the moderating role of non-governmental organizations (NGOs) in the success of social entrepreneurship in Lebanon.

Design/Methodology/Approach
Using a cross-sectional survey design, the authors collected primary data from 389 social entrepreneurs through questionnaires in selected locations in Lebanon. The data collected were analyzed using descriptive and inferential statistics. The hypotheses were tested using linear regression and structural equation modeling (SEM) for predicting the impact of independent variable on the dependent variable. The validity, progressive and various models fits were tested using root mean square of approximation, root mean square of residuals, standard root mean square residuals, incremental fit index, fitness of the extracted and non-normal fit index.

Findings
The SEM estimations reveal that three main factors determine the success of social entrepreneurs in Lebanon, namely, environmental factors, psychological factors and prior experience. Moreover, the results reveal that support of NGOs positively moderates the relationships between the success of social entrepreneurship and two different variables (psychological factors and environmental factors), but failed to moderate the relationships between success of social entrepreneurship and four variables (experience, education, leadership and founding team composition).

Originality/Value
The study contributes to the entrepreneurship and circular economy literature by explicating empirically the determinant factors of successful social entrepreneurship in Lebanon’s emerging circular economy. It also provides a fact-based social awareness on the role of local and international NGOs in supporting the social entrepreneurs in driving the idea of a circular economy. The study also validates multiple entrepreneurship theories.
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<th>ARTICLE TITLE</th>
<th>Diversity, Entrepreneurial Innovation, and Performance of Healthcare Sector in the COVID-19 Pandemic Period</th>
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<td>ABSTRACT</td>
<td>This research explores the correlation between diversity, entrepreneurial innovation, and performance of the Lebanese healthcare sector during the COVID-19 pandemic period. It aims to analyze the nature of the following correlations (a) the impact of workforce diversity on entrepreneurial innovation, (b) the impact of workforce diversity on performance, and (c) the impact of entrepreneurial innovation on performance. Using a cross-sectional survey design, we collected the primary data from heterogeneous respondents including 870 patients and 261 executives leading 87 major private hospitals and other medical centers in Lebanon. Structural Equation Modeling (SEM) is employed to predict multivariate causal relationships between latent constructs and measured variables. The results of the SEM model reveal that gender diversity (GD) is a key success factor of workforce performance in the Lebanese healthcare sector since it can increase both process innovation (PI) and organizational innovation (OI) and also enhance organizational performance (OP) and patient satisfaction (PS). The results indicate that age diversity (AD) especially the presence of youth in medical centers has a positive and significant impact on organizational performance and patient satisfaction. Finally, the results of this study show that the presence of women and youth in the Lebanese healthcare sector improves entrepreneurial innovation and thus, leads to enhance the performance level and the quality of healthcare outcomes. This research provides original information that supports executive managers in the healthcare sector during crisis periods. Managerial practices and policies designed to foster diversity can improve workforce performance and the quality of medical outcomes.</td>
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<td>Author(S)</td>
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<td>This paper investigates whether or not banks in the MENA region are susceptible to failures. Two z score models are investigated in predicting the health of ninety banks across ten countries. Using discriminant and regression analysis, one can determine which ratios are statistically significant in predicting the health of the selected banks and which zone they belong to safe, grey, or distressed zone. The study spans the years 2006 to 2016. The goal of this study is to compare two z scores to assess if banks within MENA are subject to failure. According to the findings of this study, the Z score developed by El Ansary may be a better way for emerging economies to measure the indicators that trigger banks’ risk level.</td>
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<tr>
<td>Author(S)</td>
<td>Saad R., Mostafa N.</td>
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<th>ARTICLE TITLE</th>
<th>Factors Affecting Accounting Students’ Performance at University in Lebanon</th>
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<td>JOURNAL</td>
<td>BAU Journal-Creative Sustainable Development</td>
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<td>PUBLICATION INFO</td>
<td>3(2): 1-28</td>
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<td>THEME / SUBTHEME</td>
<td>Society, Culture and Human Behavior/ Human Behavior in Organizations</td>
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Forecasting a Stock Trend Using Genetic Algorithm and Random Forest

Journal of Risk and Financial Management

2022

DOI: 10.3390/jrfm15050188

Society, Culture and Human Behavior/ Human Behavior in Organizations

This paper addresses the problem of forecasting daily stock trends. The key consideration is to predict whether a given stock will close on uptrend tomorrow with reference to today’s closing price. We propose a forecasting model that comprises a features selection model, based on the Genetic Algorithm (GA), and Random Forest (RF) classifier. In our study, we consider four international stock indices that follow the concept of distributed lag analysis. We adopted a genetic algorithm approach to select a set of helpful features among these lags’ indices. Subsequently, we employed the Random Forest classifier, to unveil hidden relationships between stock indices and a particular stock’s trend. We tested our model by using it to predict the trends of 15 stocks. Experiments showed that our forecasting model had 80% accuracy, significantly outperforming the dummy forecast. The S&P 500 was the most useful stock index, whereas the CAC40 was the least useful in the prediction of daily stock trends. This study provides evidence of the usefulness of employing international stock indices to predict stock trends.

Impact of Corporate Social Responsibility Practices on Financial Performance: Evidence from Selected MENA Region Commercial Banks

BAU Journal - Creative Sustainable Development

2022

3(2): 1-17

Society, Culture and Human Behavior/ Human Behavior in Organizations

Nowadays, corporations are being held accountable for their actions that affect their surroundings. Thus, corporate social responsibility (CSR) has been integrated in their business models, which can impact their financial performances (FP). Previous researches regarding the relationship between CSR and FP have yielded mixed results. Thus, this research aims at identifying the impact of CSR practices in the environment (ENV), human resources (HR), products and consumers (PC) and community involvement (CI) on FP of 81 commercial banks operating in selected MENA countries for the year 2018. Data were gathered from CSR report and annual report for each bank. The multiple regression analysis reveals that there is a positive significant relationship between CSR practices in HR and PC and FP of MENA banks. However, there is a non-significant relationship between CSR practices in the ENV and CI and FP of these banks. Thus, MENA banks are encouraged to engage in CSR practices revolving around HR and PC in order to enhance their FP.
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<th>ARTICLE TITLE</th>
<th>Students’ Loyalty: Does Value Co-creation in Higher Education Institutions Matter?</th>
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<td>PUBLICATION INFO</td>
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<td>THEME / SUBTHEME</td>
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<tr>
<td>ABSTRACT</td>
<td>This study investigates the influence for intrinsic and extrinsic motives on customers’ participation in value co-creation activities (CPVCA), beside examining the direct and indirect impact for CPVCA on customers’ loyalty. Quantitative research approach is used, while the study population encompasses all Lebanese private universities students. A questionnaire was developed to gather data from 403 universities’ students who were chosen using the convenience sampling technique. PLS-SEM was adopted to examine the study proposed scale validity and the relationships between its latent variables. The current study results indicate a positive influence for both intrinsic and extrinsic motives on CPVCA. Also, the findings reveal a significant direct relationship among CPVCA and customer loyalty, as well as an indirect relationship via mediating brand experience.</td>
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| Author(S) | Bazzi A., Ali A., Mostapha N. |

<table>
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<tr>
<th>ARTICLE TITLE</th>
<th>The Impact of Corporate Governance and Political Connectedness on the Financial Performance of Lebanese Banks during the Financial Crisis of 2019-2021</th>
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<td>PUBLICATION INFO</td>
<td>DOI: 10.3390/jrfm15050203</td>
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<td>THEME / SUBTHEME</td>
<td>Society, Culture and Human Behavior/ Human Behavior in Organizations</td>
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<tr>
<td>ABSTRACT</td>
<td>The Lebanese banking sector has become risky due to political and economic crises. At such times, corporate governance mechanisms ensure objectivity of assessment and rationality in decision making. We examine the impact of internal corporate governance mechanisms on the performance of Lebanese banks, with political involvement in the administration and ownership of the banks. We used linear regression on a sample of 194 bank-year observations from 2016 to 2021. The presence of independent members on boards of directors, and ownership concentration due to family ownership, had positive effects on bank return on assets, return on equity, liquidity levels, and loans issued. Efficient control, along with the presence of audit, and compliance committees reduced risk by increasing capital adequacy and reducing non-performing loans. Both administrative political connections and ownership political connections increased return on assets, increased return on equity, increased liquidity levels, and increased loans to deposits, while increasing non-performing loans. Agency conflicts suggest that granting loans due to political pressure increased non-performing loans.</td>
</tr>
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| Author(S) | El-Chaarani H., Ismail T., El-Abiad Z., El-Deeb M. |

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<th>The Impact of COVID-19 on Financial Structure and Performance of Islamic Banks: A Comparative Study with Conventional Banks in the GCC Countries</th>
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| Author(S) | El-Chaarani H., Abraham R. |

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ABSTRACT

Purpose
The aim of this paper has twofold: (1) to explain and compare the financial evolution of Islamic and conventional banking sector in the Gulf Cooperative Council (GCC) countries before and during the COVID-19 pandemic and (2) to explore the key success factors that might affect Islamic and conventional banks performance before and mainly during COVID-19 pandemic period.

Design/Methodology/Approach
Orbis Bank Focus database and annual financial reports are used to collect financial information of Islamic and conventional banks in GCC countries over four years: 2017, 2018, 2019 and 2020. Descriptive statistics, T-test, multiple regression, and 2SLS and GMM models are employed to analyze the financial structure and performance of Islamic and conventional banks before and during the COVID-19 pandemic period.

Findings
Results of this study reveal that (1) there is a significant difference between Islamic banks and conventional banks during the crisis of COVID-19, where the conventional banks have presented a higher level of financial performance and financial liquidity than their Islamic counterparts, (2) conventional banks have revealed higher capacity to manage their financial risk during the crisis period, and (3) a high level of non-performing loan, high inflation rate and high percentage of non-important cost have a negative impact on the financial performance of Islamic banks mainly during the pandemic period of COVID-19. However, the result indicates that a high level of liquidity risk increased the performance of Islamic banks but this impact falls sharply during the pandemic period.

Originality/Value
This study provides information that supports investors, regulators and executive managers in GCC countries. A well-structured balance sheet would improve the financial performance and risk management of the banking sector in GCC countries, especially in times of crisis and pandemics.

Author(s)
Nouraldeen R., Mandour M., Hegazy W.

ARTICLE TITLE
The Impact of Interactive Internal Audit Function Quality Determinants and Coordination on Audit Report Lag

JOURNAL
BAU Journal-Creative Sustainable Development

YEAR
2020

PUBLICATION INFO
2(1): 1-32

THEME / SUBTHEME
Society, Culture and Human Behavior/ Human Behavior in Organizations

ABSTRACT

The current study has three main objectives: (1) to investigate the joint impact of internal audit function (IAF) independence factors and competence on the coordination between IAF and external auditor (EA); (2) to examine the effect of coordination on audit report lag; (3) to investigate the joint impact of IAF independence factors and competence on audit report lag. To the best of the researchers’ knowledge there is no previous study shed the light on the interactive impact of IAF quality determinants on coordination and on audit delay. In addition, this study is the first that examines the mediating effect of coordination on the associations between the interactive IAF quality determinants and audit report lag. This paper is conducted based on a sample of Lebanese banks operating in Lebanon, focusing on the three-year period from 2016 to 2018. The researchers adopt the Partial Least Square (PLS) 3 for analyzing data and testing the posited hypotheses. The results show that the first and second interactions between IAF independence factors and competence have respectively moderate and weak positive effect on coordination. The outcomes also show that the first and second interactions have respectively weak and moderate negative effect on audit report lag. However, both coordination and bank size (control variable) have no effect on audit report lag. The results also reveal that there is no mediating effect of coordination on the associations between each of interaction [1] and [2] and audit report lag. This study has some limitations that can be used as base for further future research. For example, the current paper is conducted on a small sample size that may limit the power of this research to generalize its findings. The results of this study provide significant insights to the board of directors, audit committees (ACs), IAFs, managements, and EAs of the Lebanese banking sector, and the governmental and regulatory bodies of the banking sector.

Author(s)
Easa N., Bazzi A.

ARTICLE TITLE
The Influence of Employer Branding on Employer Attractiveness and Employee Engagement and Retention: Ten Years of Literature

JOURNAL
International Journal of Customer Relationship Marketing and Management

YEAR
2020

PUBLICATION INFO
11(4): 48-69

THEME / SUBTHEME
Society, Culture and Human Behavior/ Human Behavior in Organizations
### BOOK CHAPTER

**Title**: An Overview of Research and Development in Academia

**Authors**: Baydoun E., Mesmar J., Beydoun A., Hillman J.

**Year**: 2022

**Publisher**: Springer, Cham.

**ISBN**: Society, Culture and Human Behavior/ Human Behavior in Organizations

**Abstract**

This overview chapter encompasses the main underpinning themes of research and development (R&D) of universities around the world. Our observations and opinions apply equally to public-sector university-linked research institutes that conduct mainly original research as opposed to policy research. After an Introduction that includes defining the terms used in the chapter and scoping the topic, the main 13 sections of the chapter cover:

- (a) R&D as a fundamental feature of human development reflecting the inherent curiosity of humans and their ability to learn and implement their knowledge.
- (b) The rationale for modern governments to invest in R&D, referring to the New Growth Theory and meeting the needs of modern societies.
- (c) The rationale for private-sector organisations to invest in R&D to ensure their long-term sustainability and competitiveness.
- (d) The various definitions and concepts of R&D and Research & Experimental Development.
- (e) The roles and implications of the rapidly expanding number of transformative technologies that are not only profoundly transforming virtually all R&D but also the operation of modern societies including universities.
- (f) The need for specialist facilities, staffing, and learned societies for R&D to thrive.
- (g) The importance of international collaboration.
- (h) Funding sources for R&D.
- (i) The actuality of academic R&D, including both good practice and deleterious effects of poor management.
- (j) The pivotal wide-ranging roles of governments.
- (k) Impediments to successful R&D in both the public and private sectors.
- (l) Geopolitical aspects of R&D.
- (m) Future of R&D.

The Conclusions Section considers recommendations on R&D policies for the Arab world as well as for developing economies based on our global analysis of R&D.

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**ABSTRACT**

This paper aims to review the literature over the past 10 years related to employer branding by shedding light on its role of enhancing employer attractiveness, employee engagement, and retention. The paper offers a better understanding for the literature gap related to the employer branding field. A systematic review of 33 articles published between 2010 and 2019 was conducted in which the reviewed papers were classified depending on electronic databases, namely Emerald, Science Direct, and Business Source Complete. The research findings were analyzed based on two classifications: descriptive and main topic analysis. The majority of the reviewed articles were empirical studies published during the year 2018, revealing the importance of employer branding by creating employer attractiveness, employee engagement, and employee retention, in addition to focusing on employee retention as a main tool for achieving a competitive advantage.
Achieving Visual Comfort in University Educational Spaces: A Design Framework for Responsive Kinetic Skin

Author(s) Belok F., Rabea M., Hanafi M., El-Bastawissi I.

<table>
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<td>Architecture &amp; Planning Journal-APJ</td>
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<td>25(1): 1-10</td>
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<td>THEME / SUBTHEME</td>
<td>Creative Sustainable Development/ Environmental Studies and Sustainability in Architecture</td>
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<tr>
<td>ABSTRACT</td>
<td>Achieving human comfort in a space is an architectural necessity. Feeling comfort is related to the sense organs network, such as the eyes, ears, nose, tactile sensors, heat sensors and brain. In fact, last few decades have witnessed the integration of many technologies and trends into the field of responsive architecture, among which kinetic architecture has been significant. Thus, the aim of this thesis is to achieve visual comfort in educational spaces in universities, while arguing that a responsive kinetic skin is to be an effective mean for achievement. That should help refreshing student and enhancing their educational spaces visually, by considering various factors, such as the light transmitted through the kinetic system and the colors of kinetic units. Consequently, student health will be enhanced mentally and psychologically. In the thesis, several kinetic skin alternatives will be simulated digitally, to choose one of them that will be applied and tested as a physical model (scale 1/1) in one of the universities spaces. The outcome of this thesis is giving a framework for designers and architects to design responsive kinetic skin in universities respecting visual comfort of students. This framework will be presented through a graphical user interface (GUI) that can be easily used by architects.</td>
</tr>
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</table>

* Names in Bold Indicate BAU Authors
ARTICLE TITLE
Conservation of Beirut’s Urban Heritage Values Through the Historic Urban Landscape Approach

JOURNAL
Urban Planning

YEAR
2022

PUBLICATION INFO
7(1): 101-115

THEME / SUBTHEME
Society, Culture and Human Behavior/ Theories, History, and Humanities in Architecture

ABSTRACT
Cities are complex urban systems with dynamic transformations in their socio-economic and environmental dimensions. Several studies have shed light on the fragility of the urban heritage and the strategies of its conservation. The historic urban landscape (HUL) approach is a new framework adopted by UNESCO to deal with urban heritage. This article aims to apply the HUL approach to the rehabilitation and management of Beirut historic neighbourhoods impacted by the massive Beirut port explosion, focusing on Armenia Street in the Mar Mikhael neighbourhood as a case study. The application of the HUL framework allows for the re-evaluation of heritage not as an individual physical form but as an urban fabric interconnected to the city, inclusive of its cultural, social, architectural, and urban layers. The article investigates the application of the four tools identified within HUL recommendations—(1) regulatory systems, (2) community engagement, (3) planning, and (4) financial tools—by proposing implementation strategies in the assessment of urban heritage to mitigate major risks. The result reveals that cooperative efforts among private and public stakeholders can play a vital role in the development of Beirut heritage, acting as catalysts for urban heritage conservation. Strategies for establishing a new legislative framework that is focused on protecting Lebanese cultural heritage and ensuring sustainable adaptation planning are highlighted.

ARTICLE TITLE
Applying Metamorphosis Philosophy to Revive the Abandoned Buildings

JOURNAL
Architecture & Planning Journal-APJ

YEAR
2022

PUBLICATION INFO
28(1): 1-15

THEME / SUBTHEME
Society, Culture and Human Behavior/ Theories, History, and Humanities in Architecture

ABSTRACT
The metamorphosis philosophy is related to architecture, for instance this translation is showcased in the transformation of spaces in buildings that is either done by the destruction or modification of the architectural product. Unfortunately, many buildings, structures and spaces are left abandoned because of changing situations, war, or natural causes. These abandoned buildings can increase the crime rate and leave lands covered in leftover spaces which can have drastic consequences on the environment. Therefore, the aim of this paper is to propose a set of design approaches that can apply the philosophy of metamorphosis in the revival of abandoned buildings with the goal of discovering adaptive solutions for abandoned buildings through their transformation. Hence, to accomplish this aim, this paper will cover accordingly a literature review, desk research case studies and previous readings about the relation of metamorphosis to abandoned buildings. Through the analysis, the research will detect ways of applying space transformation to abandoned buildings and will test the role of metamorphosis in reviving a place. That being the case, the paper will highlight on the reuse of abandoned buildings in Mar Mikhael, Lebanon as a case study.
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<th>Author(S)</th>
<th>Naim B., Felix M.</th>
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<td>Evaluating the Impacts of Courtyards on Educational Buildings, Case Study in the University of Sharjah</td>
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<td>THEME / SUBTHEME</td>
<td>Creative Sustainable Development/ Environmental Studies and Sustainability in Architecture</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>Courtyards are traditionally associated with the Middle East countries, where climate and culture have given shape to a particular type of traditional architecture. The study evaluates the environmental and social impacts of courtyards in an educational building integrated with occupant's interaction behavior. The case study of the University of Sharjah includes eight different courtyards unoccupied for many years, in different locations around the building with various proportions; the objectives were to examine and evaluate the impact of redesigning the interior spaces of the courtyards in terms of environmental and social aspects. The inductive and experimental approach were adopted in this research, where two surveys were conducted for the occupants, before and after the design applications. In addition to the use of eco-tech software for simulation. In conclusion, the results of surveys and interviews clarified the problem and offered some recommendations and simulation analysis provided recommendations and guidelines for designers.</td>
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**From Waste to Energy: Reuse Of Landfills To Create Eco-Friendly Spaces**

**Author(s)**: Maasarani M., Afify A., Mohsen H., Youssef M.

**Article Title**: From Waste to Energy: Reuse Of Landfills To Create Eco-Friendly Spaces

**Journal**: BAU Journal-Creative Sustainable Development

**Year**: 2022

**Publication Info**: 3(2): 1-16

**Theme/Subtheme**: Creative Sustainable Development/Environmental Studies and Sustainability in Architecture

**Abstract**: Waste to Energy (W to E) minimize the amount of waste sent to landfill, which also reduces negative impacts on the environment. This problem has been a common occurrence since the beginning of time. Waste to Energy will assist in the creation of a low-carbon society.

Currently, the challenge behind reaching Eco-friendly space is a result of the continuity of incineration and landfill uncontrolled Municipal Solid waste on slopes and seashore. This environmental disaster as worldwide landfill is oversaturated and can collapse at any moment and cause dangerous damage to the environment. The average trash production increased phenomenally worldwide, resulting in numerous environmental and health concerns. The landfill's greatest height point reached 30 meters, which is much above the minimum-engineered height. Renewable Energy refers to a variety of treatment technologies that convert waste into sustainable development like electricity, heat, fuel or other usable material, as well as a variety of waste. Renewable Energy is divided into four categories: thermal, mechanical, thermochemical and biochemical. Therefore, this research aims to establish guidelines to Reuse the Landfills and create Eco-Friendly Spaces, explore the potential of landfills in reused as new recreational Eco-friendly spaces and to establish Renewable energy. To achieve this aim, the paper will follow a scientific methodology, starting with a literature review highlighting the definition of Waste to Energy, understanding its causes and types, then focus on different methods applying for this disaster and its relation to the city. As focused case study, this paper summarizes the methodology for applying Renewable Energy and transforming the mountain of garbage into entertainment and amusement park. As a conclusion, this research will analyze the effectiveness of Waste to Energy and how it functions strategically in order to improve the quality of life.

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**Extending the Role of Architecture Intervention across the Disaster Life Cycle**

**Author(s)**: Zahra K., Afify A., Mohsen H., Youssef M.

**Article Title**: Extending the Role of Architecture Intervention across the Disaster Life Cycle

**Journal**: BAU Journal-Creative Sustainable Development

**Year**: 2022

**Publication Info**: 3(2): 1-16

**Theme/Subtheme**: Creative Sustainable Development/Environmental Studies and Sustainability in Architecture

**Abstract**: Disasters have been a common occurrence since the beginning of time, yet they are increasing phenomenally worldwide and especially in developing countries. Factors that led to the cause of destructive disasters are often complex and interrelated; researchers detect human influence and rapid development is intensifying the damage and scale of disaster-prone areas through urban sprawl and human interference. Observing the disaster life cycle, it is made up of four stages: preparedness stage, resilience and mitigation stage, response and relief stage, and finally reconstruction and recovery stage. The main focus usually lies in the response and relief stage which comes immediately after the disaster has struck. The aim of this research is to extend the architectural intervention across all stages of the disaster; using a dynamic disaster response system made up of three components, primarily a disaster educational centre that can reliably respond to any disaster occurrence using a network of prebuilt structures spread across the perimeters of disaster-prone areas. The structures help with strategic preparedness, promote resilience, mitigating damage and spread, provide recovery and relief, and aid in eventual reforestations and reconstructions. As well as, designed to host an adaptable module of prefabricated units that can be easily mobilized and transported to plug-in to the host structures; the hosting structures will also provide a mechanical response across all stages of the disaster life cycle with a minimum disruptive footprint. Utilizing primarily the inductive method, this research will analyse the effectiveness of this unconventional architectural design approach in how it functions both reactively and strategically across all stages of any disaster life cycle. The paper also relies on analytical and deductive methods to help portray the effectiveness of the unconventional architectural design approach in how it functions both reactively and strategically across all stages of any disaster life cycle.
### ARTICLE TITLE
Integrated Innovative Solar Lighting System for Optimization of Daylight Utilization for Public Library in Alexandria, Egypt

### JOURNAL
Ain Shams Engineering Journal

### YEAR
2022

### PUBLICATION INFO
DOI: 10.1016/j.asej.2022.101819

### THEME / SUBTHEME
Creative Sustainable Development/ Environmental Studies and Sustainability in Architecture

### ABSTRACT
Lighting has evolved over recent decades from an engineering perspective, in which ensuring safety and performance both indoors and outdoors has become a key discipline, engaged in a wide range of areas and having a profound impact on our daily lives. In this paper, a case study of a modern public library building will be addressed, with the main purpose of discussing energy efficiency related to light. Three parallel routes will be demonstrated to improve energy efficiency. The first is the integration of solar systems (PV) and the replacement of artificial lighting systems. The second is a change of building materials, internally and externally, to nanomaterials, and the third is through including an innovative anidolic lighting system, designed and applied in order to enhance the amount of daylight inside the library in a controlled manner. The inclusion of a vertical lighting system allows the optimization of solar energy resources, preserving the library’s style in a simple way. The system includes a collector light system, compounded by a truncated and double compound parabolic collector (PCPC) to capture natural light from outside over a wide angular range (180°) without a tracking system, preserving the building design and saving on costs and maintenance. These parallel routes, based on solar energy and lighting, can make a positive impact with minimum changes in the Alexandria library, providing environmental improvement and protecting buildings and human health in order to achieve a more sustainable example of architecture.

### ARTICLE TITLE
Proposing Guidelines to Upgrade the Open Public Spaces in the Informal Settlements

### JOURNAL
Architecture & Planning Journal

### YEAR
2022

### PUBLICATION INFO
28(1): 1-20

### THEME / SUBTHEME
Society, Culture and Human Behavior/ Theories, History, and Humanities in Architecture

### ABSTRACT
Informal Settlements have expanded rapidly in the last fifty years and have kept rising. With rapid population expansion has come an increase in haphazard urbanisation and informal settlements, frequently referred to as slums. Defined as a settlement that was formed in an unplanned and uncontrolled way, which means they are mostly unrecognized. Unfortunately, focusing on the problem of current challenges in informal settlements, on the socio-cultural and environmental levels, which are facing a massive shift in the quality of life in these sites, this is reflected in urban fragmentations, social and infrastructures are lacking, service systems that have become progressively inefficient over time, a shortage of open public spaces, and inequality. Which all influence the urban environment. This paper, therefore, aims to provide guidelines to upgrade the open public spaces in the informal settlements to evolve these sites. To achieve this aim, the paper will follow a scientific methodology, starting by presenting a literature review highlighting the definition of an informal settlement, recognizing its causes, types, and its relation to the city. As a focused case study, the research will tackle Taamir district in Saida applying the field method, which are primarily inhabited by refugees, abandoned peoples, and fragmented families, as a scoped case study. This methodology investigated the challenges of its residents and proceeded with recommendations to improve their quality of life. These guidelines may be used to all those communities while considering the conditions of each region. As a conclusion, improving the quality of life in informal settlements includes ensuring that resident’s academic, economic, environmental, and socio-cultural issues are addressed.
ARTICLE TITLE | Secrets Beyond Rhythm of Ancient Egyptian Architecture
---|---
JOURNAL | Technology Reports of Kansai University
YEAR | 2021
PUBLICATION INFO | 63(8): 7843-7860
THEME / SUBTHEME | Society, Culture and Human Behavior/ Theories, History, and Humanities in Architecture
ABSTRACT | If someone thinks of the rhythm, the first thing that comes to his mind is the rhythm in Music, but did you come to your mind the rhythm in architecture?! Rhythm in architecture is like a visual rhythm that we find in design from a repetition of elements. Still, architectural blocks are designed to transfer the viewer’s eyes to an architectural, musical piece very creative. this paper discovers the meaning of rhythm and types of rhythm and how it influences the design. Also, it is the focal point of this research. This research will explain the relationship between music and rhythm in architectural design. To understanding it we will discover rhythm in great Egyptian architectural designed by the musical harmony.

ARTICLE TITLE | The Impact of Living Heritage Approach for Sustainable Tourism & Economics in Mount Lebanon
---|---
JOURNAL | HBRC Journal
YEAR | 2021
PUBLICATION INFO | 17(1): 491-517
THEME / SUBTHEME | Society, Culture and Human Behavior/ Theories, History, and Humanities in Architecture
ABSTRACT | This paper explores the impact of the living heritage approach for sustainable tourism & economics in Mount Lebanon. The proposed living heritage model is separated into three fundamental actions: firstly, the identification of important historical places and buildings that are reused to serve conservation and tourism development, as well as the participation of the core community in determining this. Secondly, the development of a tourism strategy and development plans, in which the local community must also participate. Thirdly, the development of maintenance and control programs, which must be supervised by the local community through its partnership with the Ministry and those responsible for conservation operations. Moreover, the hypothesis is to find a way to implement the living heritage in a local rural context. It also tackles different ways of implementing the living heritage approach based on international case studies (Albergo Diffuso, in Italy and the Meteora, in Greece), to inform sustainable economic and tourism development in the local rural context of Mount Lebanon. The methodological study will take into consideration two analyses: a theoretical (literature reviews and main definitions) and a practical (comparative analysis and case studies). In conclusion, several strategies can be taken into account in order to attain a successful living heritage of sustainable economics and tourism in Mount Lebanon. In fact, such a goal will be achieved through the partnership among private, public, and local sectors that can create a strong historical-touristic-economic bond.
Reduce Environmental Impacts on Architectural Heritage—Case Study Six Sigma Technique to Achieve High-Performance for Historic Buildings in Lebanon

Preservation of architectural heritage is a top priority for every long-term development strategy. The idea is to create a healthier world by lowering environmental effects on architectural heritage by means of inventive, rapid and cost-effective options to eco-renovating heritage buildings. Conservation practices and initiatives must adhere to the historic current fabric, including its applications, connections, and values. These approaches must be focused on an enhancement strategy to reduce negative effects of environmental on historical buildings. Lebanon is facing a slew of environmental issues as a result of poor environmental management, especially in the historic constructed environment. Because of this, the study will review the relationship between architecture and environment, discussing sustainable architecture, green buildings and its characteristics, and sustainability and architectural heritage conservation. Moreover, the study also explores architectural heritage and high-performance buildings, clarifying the impact of environment on architectural heritage, high performance buildings and their design objectives and characteristics. The study focuses mainly on quality techniques and high performance buildings, presenting quality in architecture aspects and Six Sigma as a quality improvement technique for enhancing performance of existing buildings. In this sense, we will shed some light on various attempts of green buildings and reduction of environmental impact on architectural heritage in Lebanon. The study proposes a new methodology as a performance improvement approach for converting the historical building into a high-performance one. The paper also emphasizes the role of sustainable development implementations to conserve the architectural heritage, while optimizing performance characteristics of historical buildings, using Six Sigma technique as enhancement strategy to achieve high-performance for historic buildings in Lebanon.
<table>
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<tr>
<th>ARTICLE TITLE</th>
<th>A 3D Semianalytical Model for Simulating the Proppant Stresses and Embedment in Fractured Reservoir Rocks</th>
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<tr>
<td>JOURNAL</td>
<td>Journal of Porous Media</td>
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<tr>
<td>YEAR</td>
<td>2022</td>
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<tr>
<td>PUBLICATION INFO</td>
<td>25(6): 21-35</td>
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<td>THEME / SUBTHEME</td>
<td>Science and Technology/ Simulation, Modeling and Design</td>
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<tr>
<td>ABSTRACT</td>
<td>Hydraulic fracturing uses substantial amounts of proppants to keep the fracture open. The arrangement of proppants inside the fracture depends on several parameters that are included in the pad stage, slurry stage, and rock properties. Lower amounts of proppants can be fitted close to the fracture tip due to the limited fracture width. Therefore only one layer of proppants might form, either as a compacted monolayer or a less compacted partial monolayer. The interaction of rock and proppant during drawdown can lead to proppant embedment in ductile formations, and proppant or rock crushing in brittle formations. Both cases cause a loss of fracture conductivity, which directly impacts well productivity. A better understanding of the relationship that exists between proppants and rocks can allow better treatment designs. This interaction is investigated in this study through the development of a semianalytical model. This model uses the basis of contact mechanics for sphere-plane interactions to find the deformation profile of the fracture. Different parameters were considered in this study, including proppant size and arrangement. The results were compared with an existing analytical model and a numerical model. The simulation results suggest that using nonuniform proppant sizes in a fractured rock can have a significant impact on the crushing and embedment of proppants. Furthermore, a mixture of proppant sizes can provide a better fracture conductivity for the cases considered in this study. The ultimate compressive strength of the larger-sized proppants is a critical parameter in the success of this design.</td>
</tr>
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</table>

* Names in Bold Indicate BAU Authors
**ARTICLE TITLE**

A Filter-Less Time-Domain Method for Reference Signal Extraction in Shunt Active Power Filters

**JOURNAL**

Energies

**YEAR**

2022

**PUBLICATION INFO**

DOI: 10.3390/en15155568

**THEME / SUBTHEME**

Science and Technology/ Energy and Environment

**ABSTRACT**

Current distortion degrades power quality and affects system performance, especially for sensitive loads that require pure sinusoidal waves. Owing to its excellent dynamic response, a well-designed active power filter (APF) can achieve a total harmonic distortion (THD) within the acceptable limits defined by IEEE 3002 standards through compensating harmonic distortions. The APF consists of two main modules: a reference signal extraction module and a modulation module. This paper adapts the matrix pencil method, a well-known model-based parameter estimation technique, to the problem of reference extraction. Contrary to conventional time-domain methods such as the synchronous reference frame (SRF) and the reactive power theory (PQ theory) that rely on low-pass filters in their implementations, the proposed method does not use a filter. However, it extracts the reference signal by first decomposing the load current into its constituent frequency components, and then subtracting the pure sine wave synthesized from the obtained fundamental component from the load current. Results on simulated data from MATLAB/Simulink confirm the higher accuracy and fast response time of the proposed method in extracting the reference signal.

**Author(S)**

El Ghaly A., Tarnini M., Moubayed N., Chahine K.
### Chemical Shrinkage of Paste and Mortar Containing Limestone Fines

**Author(s)**: Khatib J., Ramadan R., Ghanem H., Elkordi A., Baalbaki O., Kırız M.

**Article Title**: Chemical Shrinkage of Paste and Mortar Containing Limestone Fines

**Journal**: Materials Today: Proceedings

**Year**: 2022

**Publication Info**: 61(Part2): 530-536

**Theme / Subtheme**: Science and Technology/ Materials Engineering

**Abstract**: The effect of including limestone fine (LF) on the chemical shrinkage of cement paste and mortar is investigated. The cement was partially replaced with 0 to 20% (by weight) with LF. The water to cementitious material (CM) ratio was maintained at 0.45. In the mortar mixes, the proportion of sand (S) to CM was 1:2. In addition to the chemical shrinkage test, compressive strength and density of specimens were determined. The chemical shrinkage data were collected up to 28 days. However, for compressive strength and density, testing continued up to 90 days of water curing. There appears to be an increase in chemical shrinkage between 10 and 15% limestone for both paste and mortar mixes. The trend appears to be similar for the compressive and density results.

### Dynamic Modulus and Phase Angle of Asphalt Concrete Mixtures Containing Municipal Solid Waste Incinerated Fly Ash as Mineral Filler Substitution

**Author(s)**: Joumblat R., Al Masri Z., Elkordi A.

**Article Title**: Dynamic Modulus and Phase Angle of Asphalt Concrete Mixtures Containing Municipal Solid Waste Incinerated Fly Ash as Mineral Filler Substitution

**Journal**: International Journal of Pavement Research and Technology

**Year**: 2022

**Publication Info**: DOI: 10.1007/s42947-022-00190-x

**Theme / Subtheme**: Science and Technology/ Construction, Planning and Design

**Abstract**: Waste and recycled materials have been introduced in asphalt concrete mixtures as substitute for raw aggregates along with the efforts towards constructing sustainable pavements. Municipal solid waste incinerated (MSWI) fly ash is among the alternative materials that can be used as substitute for the natural mineral filler. However, the effect of using (MSWI) fly ash on the mechanical properties of bituminous mixtures is fragmented and not thoroughly evaluated. Additionally, various studies assessed the performance of asphalt mixtures with (MSWI) fly ash used as filler substitution. The objectives of this research study is characterising asphalt concrete mixtures with (MSWI) fly ash used as substitute for the limestone filler, notably 0%, 25%, 50%, 75% and 100% by weight of aggregates and evaluating their performance in comparison with the control mix. This is conducted mechanistically through linear viscoelastic characterisation.
### Effect of Chemical Warm Mix Additive on the Properties and Mechanical Performance of Recycled Asphalt Mixtures

**ABSTRACT**

- Linear viscoelastic characterisation comprises measurement of the stiffness of the mixture expressed in terms of dynamic modulus and the extent of elastic and viscous response expressed in terms of phase angle. The findings revealed that the use of (MSWI) fly ash in asphalt concrete mixtures as filler substitution increased the rutting resistance up to 50% of incorporation and the resistance to low temperature cracking when incorporated in percentages higher than 25%.

**Author(S)**

Barraj F., Khatib J., Castro A., Elkordi A.

**ARTICLE TITLE**

Effect of Chemical Warm Mix Additive on the Properties and Mechanical Performance of Recycled Asphalt Mixtures

**JOURNAL**

Buildings

**YEAR**

2022

**PUBLICATION INFO**

DOI: 10.3390/buildings12070874

**THEME / SUBTHEME**

Science and Technology/ Materials Engineering

**ABSTRACT**

Newer technologies such as warm mix asphalt (WMA) and reclaimed asphalt pavement (RAP) have gained international approval and have been considered as appropriate solutions that support the sustainability goals of the highway sector. However, both technologies present some shortcomings. The lower mixing and compaction temperatures of WMA reduce the binder aging and the bond between the aggregates and the coating binder, thus resulting in less rutting resistance and higher moisture susceptibility. On the other hand, RAP mixes tend to be stiffer and more brittle than conventional hot mix asphalt (HMA) due to the effect of aged binder. This tends to increase the crack propagation distresses. In an attempt to overcome their individual shortcomings, this study investigated the new concept of a combined WMA-RAP technology. The chemical WMA additive Rediset LQ1102CE was utilized with mixtures incorporating low (15%), medium (25%), and high (45%) RAP contents. Dynamic modulus (E*) and flow number (FN) tests were conducted to investigate the effect of Rediset on the behavior of RAP mixtures. The dynamic modulus (E*) mastercurves were developed using the sigmoidal model and Franken model was used to fit the accumulated permanent deformation curve. The results of this study showed that Rediset addition improved the cracking resistance of RAP mixtures. However, the rutting resistance was reduced but kept within the acceptable range except for mixtures containing low RAP content.

### Effect of Fly Ash and Metakaolin on the Properties of Fiber-Reinforced Cementitious Composites: A Factorial Design Approach

**ABSTRACT**

Fiber-reinforced cementitious composites (FRCC) have emerged as a response to the calls for strong, ductile and sustainable concrete mixes. FRCC has shown outstanding mechanical properties and ductility where special fibres are used in the mixes to give it the strength and the ability to exhibit strain hardening. With the possibility of designing the FRCC mixes to include sustainable constituents and by-products materials such as fly ash, FRCC started to emerge as a green alternative as well. To be able to design mixes that achieve these conflicting properties in concrete, there is a need to understand the composition effect on FRCC and optimize these compositions. Therefore, this paper aims to investigate the influence of FRCC compositions on the properties of fresh and hardened FRCC and then to optimize these mix compositions using factorial design approach. Three factors, water-to-binder ratio (w/b), mineral admixtures (total of fly ash and metakaolin by cement content (MAR)), and metakaolin content (MK), were investigated to determine their effects on the properties of fresh and hardened FRCC. The results show the importance of combining both FA and MK in obtaining a satisfactory fresh and mechanical properties of FRCC. Models were suggested to elucidate the role of the studied factors and a method for optimization was proposed.

**Author(S)**

Sonebi M., Abdalqader A., Fayyad T., Amaziane S., El-Khatib J.

**ARTICLE TITLE**

Effect of Fly Ash and Metakaolin on the Properties of Fiber-Reinforced Cementitious Composites: A Factorial Design Approach

**JOURNAL**

Computers and Concrete

**YEAR**

2022

**PUBLICATION INFO**

29(5): 347-360

**THEME / SUBTHEME**

Science and Technology/ Energy and Environment
## Effect of Limestone Fines as a Partial Replacement of Cement on the Chemical, Autogenous, Drying Shrinkage and Expansion of Mortars

**Author(s)**: Khatib J., Ramadan R., Ghanem H., Elkordi A., Sonebi M.

**Article Title**: Effect of Limestone Fines as a Partial Replacement of Cement on the Chemical, Autogenous, Drying Shrinkage and Expansion of Mortars

**Journal**: Materials Today: Proceedings

**Year**: 2022

**DOI**: 10.1016/j.matpr.2022.01.336

**Theme/Subtheme**: Science and Technology/Materials Engineering

**Abstract**: The use of limestone with its different applications in paste, mortar, and concrete has become a common practice, not only for the urge to control the environmental impact and conserving the virgin materials but also to improve their performance in different environments. This study focused on the effect of incorporating different percentage levels of limestone fines (LF) on the shrinkage and expansion development of mortar specimens for a total period of 28 days. To observe this effect, a total of 5 mortar mixes were employed with five substitution rate of cement with LF ranging from 0 to 20%. The ratios of water to binder and sand to binder remain constant at 0.45 and 2 respectively. Testing consisted of three types of length change; chemical, drying and autogenous shrinkage as well as expansion. It was observed that adding up to 10% LF enhanced the chemical and autogenous shrinkage of mortars. Likewise, incorporating up to 10% LF increased the expansion in mortar specimens. However, drying shrinkage of mortars increased as LF content went up. Overall, the results indicate that there is strong correlation between the chemical shrinkage and the other length change parameters and expansion.

## Evaluation of the Validity of a Minimum VMA Requirement in Superpave Mixtures

**Author(s)**: Barraj F., Joumblat R., Elkordi A.

**Article Title**: Evaluation of the Validity of a Minimum VMA Requirement in Superpave Mixtures

**Journal**: International Journal of Pavement Research and Technology

**Year**: 2022

**DOI**: 10.1007/s42947-022-00218-2

**Theme/Subtheme**: Science and Technology/Materials Engineering

**Abstract**: Difficulties in meeting the minimum voids in mineral aggregates (VMA) requirement of Superpave have been a common adversity for researchers in the mix design phase. The rationale behind having minimum VMA criteria was to guarantee durability of asphalt mixtures. However, multiple studies have demonstrated weak relationship between VMA and durability. In this study, the validity of the VMA criteria of the Superpave mix design was investigated using the film thickness perspective. Seven gradations with a nominal maximum aggregate size (NMAS) of 12.5 mm of different types (coarse, dense, gap, and fine) were considered. A poor relationship was found between the VMA and film thickness FT (durability indicator) enforced with a coefficient of determination \( R^2 = 0.0098 \) for the regression between FT and VMA. Moreover, a poor relationship was found between the effective binder content (Pbe) and VMA supported with a coefficient of determination \( R^2 = 0.0098 \) for the regression between the effective binder content (Pbe) and VMA. Both regression results indicate that the current VMA criteria is not strongly referring to the mixture durability.
ABSTRACT: The flexural behavior of partially composite concrete-encased steel tubular beams was investigated experimentally. Four T-shaped beams of 3 m length were tested under two points quasi-static loading. A comparison was performed between a control reinforced concrete (RC) beam and a fully encased steel tube in a T-shaped RC beam of the same section dimensions as the control beam and without any mesh wrapping. The effect of full and partial wrapping of the steel tube was also investigated in the other two beams where 100% and 60% of the encased steel tube length were wrapped by a 3 mm steel mesh. Discussions and interpretation of the load-deflection behaviors and the failure modes are presented in this paper. The obtained results showed that the composite beam with unwrapped encased steel tubular section provided an advantage over the control RC beam in terms of load/weight ratio and ductility by 28.5% and 22.4% respectively. Besides, the use of steel mesh wraps in different length percentages revealed a much better partial composite action between the steel tube and the surrounding concrete. The attained strength ranged between 18.2% and 33%, whereas the ductility was enhanced by 63.8% and up to 66.7%.

Author(s): Wehbi N., Masri A., Baalbaki O.
Implementation Challenges of Extended Reach Drilling and Hydraulic Fracturing Operations in Unconventional Reservoirs

Author(s) Bou Hamdan K.

ARTICLE TITLE Implementation Challenges of Extended Reach Drilling and Hydraulic Fracturing Operations in Unconventional Reservoirs

JOURNAL Petroleum and Petrochemical Engineering Journal

YEAR 2021

PUBLICATION INFO DOI: 10.23880/ppej-16000283

THEME / SUBTHEME Science and Technology/ Energy and Environment

ABSTRACT The petroleum industry faces a lot of challenges in producing hydrocarbons. These challenges became significant with the discovery of unconventional reservoirs. This called for new advanced technologies to be developed. Extended Reach Drilling (ERD) and Hydraulic Fracturing (HF) are two methods that were successfully implemented in different wells around the world. ERD has been used in numerous drilling operations where the reservoir is surrounded by troublesome formations, hence sidetracking is necessary. Hydraulic fracturing is used in the development of many unconventional wells, including shale gas reservoirs. However, these methods still face a lot of challenges during implementation, which can affect the success of the drilling and well completion design. This article discusses the main design considerations for implementing ERD and Hydraulic fracturing in an unconventional reservoir. It also covers the main challenges that should be accounted for while preparing the drilling and well stimulation design to improve the production efficiency. It includes the impact of stress shadows, frac hits, well spacing, casing design, and other factors on the overall success of the process.

Investigating the Effect of Using Unclassified Fractionated Reclaimed Asphalt Pavement Materials on the Properties of Hot Mix Asphalt

Author(s) Barraj F., Elkordi A.

ARTICLE TITLE Investigating the Effect of Using Unclassified Fractionated Reclaimed Asphalt Pavement Materials on the Properties of Hot Mix Asphalt

JOURNAL Construction and Building Materials

YEAR 2022

PUBLICATION INFO DOI: 10.1016/j.conbuildmat.2022.129099

THEME / SUBTHEME Science and Technology/ Energy and Environment

ABSTRACT Reclaimed Asphalt Pavement (RAP) incorporation is bounded by many specifications that limit its increased utilization. One of them, which many road agencies adopt, is the allowance of RAP from known single origin “classified RAP” only to be utilized in new mixtures. A lot of asphalt plants cannot afford space for multiple small RAP stockpiles in their yards and are forced to accumulate “unclassified” RAP materials collected from several projects into a single zone, hence, the “classified RAP” specification restricts the benefits of their utilization. In this context, this study aimed to investigate the pros and cons of using unclassified fractionated RAP with 15%, 25% and 45% percentages in Superpave asphalt mixtures. Complex modulus testing was performed on three replicates of each asphalt concrete (AC) mixture to evaluate the dynamic modulus (E*) and phase angle (D) properties over a range of temperatures and loading frequencies. As well, Flow number (FN) test was conducted to assess the rutting potential of the mixtures. The results showed that no significant difference existed between E* and D values of conventional hot asphalt mixture (HMA) and other RAP mixtures over the full analyzed range of frequency which indicates that the utilization of low, medium or high percentages of unclassified RAP materials may be indeed appropriate. Finally, the results of the flow number test and the simple performance indicator were compared and used to rank the rutting resistance of the assessed mixtures.

Investigation of the Experimental and Numerical Flexural Behavior of Innovative Totally Encased Composite Beams

Author(s) Wehbi N., Masri A., Baalbaki O.

ARTICLE TITLE Investigation of the Experimental and Numerical Flexural Behavior of Innovative Totally Encased Composite Beams

JOURNAL BAU Journal-Science and Technology

YEAR 2021

PUBLICATION INFO 3(1): 1-12

THEME / SUBTHEME Science and Technology/ Simulation, Modeling and Design

ABSTRACT Composite steel-concrete beams have been widely used in long span construction and high rise buildings due to their favorable behavior in terms of high strength, stiffness, and ductility. In this research, the flexural behavior of an innovative steel-concrete composite section is investigated experimentally and verified numerically using ABAQUS software. The studied section is composed of steel tubular specimen or steel hollow pipe totally encased in concrete in the absence of any flexural or shear reinforcement. Instead, steel mesh wraps are used around the tubular steel specimen to provide sufficient steel-concrete bond. All of the studied beams have the same 3m length and T-section dimensions to provide adequate comparison of results. The influence of using different percentages of steel mesh wraps around the steel specimen and the structural steel shape effect on the failure mode and ultimate flexural capacity were investigated. It was found that the ABAQUS model has provided excellent simulation of the flexural response of the studied beams with acceptable difference in results as compared to those obtained from experimental testing.
Investigation of Using Municipal Solid Waste Incineration Fly Ash as Alternative Aggregates Replacement in Hot Mix Asphalt

**Author(s)** Joumblat R., Al Masri Z., Absi J., Elkordi A.

**JOURNAL** Road Materials and Pavement Design

**YEAR** 2022

**ABSTRACT** The use of un-conventional materials in asphalt pavements is becoming popular as DOTs in many countries started to legislate their in the paving industry. The motive behind this is to get rid of available waste while maintaining or improving the pavement performance. Fly ash is among those recycled materials that can be used as a substitute for virgin aggregates in bituminous mixtures. This study investigates the effect of using Municipal Solid Waste Incineration Fly Ash (MSWI-FA) as partial or full replacement of fine aggregates and mineral filler on the performance of asphalt mixtures. The purpose of the experimental testing program is to determine the optimal MSWI-FA replacement type and percentage to be used in asphalt mixtures. This is done through a series of dynamic modulus tests with different MSWI-FA replacement percentages. The different mixes are then ranked based on their rutting and fatigue cracking potential using simple performance indicators.
**ARTICLE TITLE**
Partial Systems’ Analysis of Traffic Noise Reduction in Tarik Al Jadidah, Beirut (Joint Publication with the Faculty of Architecture-Design & Built Environment)

**JOURNAL**
BAU Journal-Creative Sustainable Development

**YEAR**
2022

**PUBLICATION INFO**
3(2): 1-15

**THEME / SUBTHEME**
Creative Sustainable Development/ Environmental Studies and Sustainability in Architecture

**ABSTRACT**
Traffic noise is considered one of the main pollutants in an urban space and has multiple side effects regarding the physical and mental health of the human being. Tarik Al Jadidah, one of the most densely populated neighborhoods in Beirut City- Lebanon, is selected as an urban area for a project-based initiative and the focal point of different studies in BAU Urban Lab. The area suffers from various urban problems, but prominently traffic noise that highly damages the urban residents’ quality of life due to its high levels of traffic noise that surpasses the World Health Organization (WHO) guidelines.

BAU Urban Lab, an interdisciplinary platform for innovation and knowledge exchange that integrates education with research has led a workshop entitled “System Modelling for Urban Health and Well-Being” held at BAU, Faculty of Architecture - Design and Built Environment. The paper proposes that Vester Sensitivity Model can be considered as a supportive decision-making tool responsible for finding the most effective variables related to Traffic Noise Reduction. The main aim of this paper is to identify the key variables affecting traffic noise reduction system through detecting the variables’ reciprocal impacts using Vester Sensitivity Model. It also depicted that the most influencing variables are those related to social, institutional, infrastructure, and resource flows of the city rather than its fixed physical infrastructure.

**Author(S)**
El-Bastawissi I., El Baba N., Khalil S., El Hage N., Joumblat R., Gatzweiler F.
In the oil and gas industry, hydraulic fracturing (HF) is a common application to create additional permeability in unconventional reservoirs. Using proppant in HF requires understanding the interactions with rocks such as shale, and the mechanical aspects of their contacts. However, these studies are limited in literature and inconclusive. Therefore, the current research aims to apply a novel method, mainly ultrasound, to investigate the proppant embedment phenomena for different rocks. The study used proppant materials that are susceptible to fractures [glass] and others that are hard and do not break [steel]. Additionally, the materials used to represent brittle shale rocks [polycarbonate and phenolic] were based on the ratio of elastic modulus to yield strength (E/Y). A combination of experimental and numerical modeling was used to investigate the contact stresses, deformation, and vertical displacement. The results showed that the relation between the stresses and ultrasound reflection coefficient follows a power-law equation, which validated the method application. From the experiments, plastic deformation was encountered in phenolic surfaces despite the corresponding contacted material. Also, the phenolic stresses showed a difference compared to polycarbonate for both high and low loads, which is explained by the high attenuation coefficient of phenolic that limited the quality of the reflected signal. The extent of vertical displacements surrounding the contact zone was greater for the polycarbonate materials due to the lower E/Y, while the phenolic material was limited to smaller areas not exceeding 50% of polycarbonate for all tested load conditions. Therefore, the study confirms that part of the contact energy in phenolic material was dissipated in the plastic deformation, indicating greater proppant embedment, and leading to a loss in fracture conductivity for rocks of higher E/Y.

The common cause of cracking in cement paste is shrinkage due to different reasons, such as loss of water and chemical reactions. Incorporating limestone fines (LF) as a cement replacement can affect the shrinkage of the paste. To examine this effect, five paste mixes were prepared with 0, 5, 10, 15 and 20% LF as a cement replacement and with a water-to-binder ratio (w/b) of 0.45. Four volume stability tests were conducted for each paste: chemical, autogenous and drying shrinkage and expansion. Chemical shrinkage was tested each hour for the first 24 h and thereafter every 2 days for a total period of 90 days. The drying shrinkage, autogenous shrinkage and expansion were monitored every 2 days until 90 days. The results showed that replacing 15% LF enhanced the chemical shrinkage of the paste. However, autogenous shrinkage of the paste was found to increase between 0 and 10% LF and decline sharply at 15 and 20% LF. Drying shrinkage was found to increase with the increase in LF content. Expansion exhibited little variation between 0 and 10% LF and an increase for replacement above 15% LF. These results are discussed in terms of the formation of hydration products and self-desiccation due to hydration.

This paper involves a comparative experimental and analytical investigation on the deflection behavior of corroded reinforced concrete simply supported beams. For this aim, two beams specimens of different dimensions are subjected to a lab-controlled environment to stimulate the effect of corrosion on their deflection values and two other beams of the same dimensions are kept intact as control beams. The impressed current technique is used for accelerating corrosion in beams for different periods of exposure. This has led to a different amount of corrosion in each beam. The load deflection variation of all the corroded and control beams is represented next when all beams are tested for bending until failure. On a parallel hand, an analytical attempt is run to determine the load deflection behavior using a simple mathematical modeling. The analytical approach involves the use of the modified deflection equations taking into account the amount of corrosion induced, the degradation in bond strength, and the resulting slipping effect in the beam. In both approaches, the corrosion phenomenon is shown to clearly affect the deflection behavior of the reinforced concrete beam. It is also noticed that a good agreement is achieved when identifying the analytical deflection value in simply supported reinforced concrete corroded beams in compare to the experimental acquired ones with some restrictions.
3. BOOK CHAPTERS

**Author(S)**

**PROCEEDING TITLE**

Risks in Oil and Gas Industry: Walkthrough Environmental Governance System in Lebanon

**CONFERENCE TITLE**

First Jordanian International Chemical Process Safety Virtual Conference (JCPSC)

**DATE**

30/3/2021

**PLACE**

Virtual Conference

**THEME / SUBTHEME**

Science and Technology/ Energy and Environment

**ABSTRACT**

Due to harsh environment and vulnerability of marine ecosystems, many challenges are faced regarding offshore oil and gas activities. Many steps are currently undertaken to overcome such challenges. As Lebanon is inside the new oil and gas sector in its offshore region, plans should be made to address environmental challenges that may occur in this sector. The Lebanese environmental governance system meets international standards in various aspects but some gaps are addressed to manage such risks that may be encountered with oil and gas activities in the Lebanese offshore.

**BOOK CHAPTER TITLE**

Applications of Nanomaterials in the Oil and Gas Industry

**BOOK TITLE**

Handbook of Research on Green Synthesis and Applications of Nanomaterials

**YEAR**

2022

**PUBLISHER**

IGI Global

**ISBN**

9781799889373

**THEME / SUBTHEME**

Science and Technology/ Energy and Environment

**ABSTRACT**

The petroleum industry has been an ever-growing industry. New technologies are always being introduced to encompass the challenges that are encountered. Nanomaterials are being included in these technologies to improve the operation of different processes. Their distinctive physical and chemical characteristics encourage their use in different sectors such as the upstream, midstream, and downstream of the oil and gas industry. In this chapter, the nanomaterials that are utilized in the oil and gas industries are highlighted. Their implementation in various applications is also provided. These applications include hydrocarbon exploration, well drilling and completion, production operations, enhanced oil recovery mechanisms, transportation, and refining operations. There is also a discussion about existing problems and possibilities for future uses.
### I. PUBLICATIONS

**ARTICLES**

<table>
<thead>
<tr>
<th>ARTICLE TITLE</th>
<th>A Boosted Minimum Cross Entropy Thresholding for Medical Images Segmentation Based on Heterogeneous Mean Filters Approaches</th>
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<tbody>
<tr>
<td>JOURNAL</td>
<td>Journal of Imaging</td>
</tr>
<tr>
<td>YEAR</td>
<td>2022</td>
</tr>
<tr>
<td>PUBLICATION INFO</td>
<td>DOI: 10.3390/jimaging8020043</td>
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<td>THEME / SUBTHEME</td>
<td>Science and Technology/ Mathematical and Computational Science</td>
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<tr>
<td>ABSTRACT</td>
<td>Computer vision plays an important role in the accurate foreground detection of medical images. Diagnosing diseases in their early stages has effective life-saving potential, and this is every physician’s goal. There is a positive relationship between improving image segmentation methods and precise diagnosis in medical images. This relation provides a profound indication for feature extraction in a segmented image, such that an accurate separation occurs between the foreground and the background. There are many thresholding-based segmentation methods found under the pure image processing approach. Minimum cross entropy thresholding (MCET) is one of the frequently used mean-based thresholding methods for medical image segmentation. In this paper, the aim was to boost the efficiency of MCET, based on heterogeneous mean filter approaches. The proposed model estimates an optimized mean by excluding the negative influence of noise, local outliers, and gray intensity levels; thus, obtaining new mean values for the MCET’s objective function. The proposed model was examined compared to the original and related methods, using three types of medical image dataset. It was able to show accurate results based on the performance measures, using the benchmark of unsupervised and supervised evaluation.</td>
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*Names in Bold Indicate BAU Authors*
<table>
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<tr>
<th>ARTICLE TITLE</th>
<th>A Comprehensive Study on the Effect of ZnO and ZnAl$_2$O$_4$ Nanoparticles on the Mechanical Properties of Epoxy Coating: Tensile and Hardness</th>
</tr>
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<tbody>
<tr>
<td>JOURNAL</td>
<td>Modern Applied Science</td>
</tr>
<tr>
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<td>2021</td>
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<tr>
<td>PUBLICATION INFO</td>
<td>15(5): 45-66</td>
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<td>THEME / SUBTHEME</td>
<td>Science and Technology/ Advanced Materials</td>
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<tr>
<td>ABSTRACT</td>
<td>ZnO and ZnAl$_2$O$_4$ nanoparticles (NPs) were successfully prepared by the co-precipitation method and characterized by x-ray powder diffraction, transmission electron microscopy, and Fourier transform infrared spectroscopy. The prepared NPs were incorporated into epoxy (EP) coating with mass ratios 200 – 800 mg/kg of ZnO NPs/EP and ZnAl$_2$O$_4$ NPs /EP. The prepared coatings were characterized by scanning electron microscopy and Fourier transform infrared spectroscopy, and their mechanical properties were investigated, at room temperature, after 5, 10, 15, and 20 days of preparation. Tensile tests showed an improvement in the tensile properties, with the best improvement in ultimate tensile strength (93.2%) for 800 mg/kg ZnAl$_2$O$_4$ NPs/EP coating after 15 days of preparation. The ZnO NPs/EP and ZnAl$_2$O$_4$ NPs/EP coatings exhibited noticeable sensitivity to the stretching rate. Vickers microhardness (Hv) investigations showed normal indentation size effect behavior for all the samples. The best improvement in Hv was attained after 5 days of preparation, for all coatings, with the best improvement (9.15%) for 700 mg/kg ZnO NPs/EP.</td>
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<td>ABSTRACT</td>
<td>In this paper, we consider a contact problem between a viscoelastic Bresse beam and a deformable obstacle. The well-known normal compliance contact condition is used to model the contact. The existence of a unique solution to the continuous problem is proved using the Faedo-Galerkin method. An exponential decay property is also obtained defining an adequate Liapunov function. Then, using the finite element method and the implicit Euler scheme, a finite element approximation is introduced. A discrete stability property and a priori error estimates are proved. Finally, some numerical experiments are performed to demonstrate the decay of the discrete energy and the numerical convergence.</td>
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<td>PUBLICATION INFO</td>
<td>DOI: 10.1016/j.padiff.2021.100156</td>
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<td>ARTICLE TITLE</td>
<td>A Priori Error Analysis of a Stabilized Finite-Element Scheme for an Elliptic Equation with Time-Dependent Boundary Conditions</td>
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<td>PUBLICATION INFO</td>
<td>14(4): 297-315</td>
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<td>THEME / SUBTHEME</td>
<td>Science and Technology/ Mathematical and Computational Science</td>
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<td>ABSTRACT</td>
<td>This study aims to implement a numerical scheme in order to find the eigenvalues of the Dirichlet-to-Neumann semigroup. This can help to check the semigroup positivity for non-circular domains. This generalized scheme is analyzed after study of the case of the unit ball, in which an explicit representation for the semigroup was obtained by Peter Lax. After analyzing the generalized scheme, we checked its convergence through numerical simulations that were performed with the use of the FreeFem++ software.</td>
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<th>ARTICLE TITLE</th>
<th>Bresse-Timoshenko Type Systems with Thermodiffusion Effects: Well-Posedness, Stability and Numerical Results</th>
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<tr>
<td>JOURNAL</td>
<td>Rendiconto del Circolo Matematico di Palermo</td>
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<td>YEAR</td>
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<td>THEME / SUBTHEME</td>
<td>Science and Technology/ Mathematical and Computational Science</td>
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<tr>
<td>ABSTRACT</td>
<td>Bresse-Timoshenko beam model with thermal, mass diffusion and thermoelastic effects is studied. We state and prove the well-posedness of problem. The global existence and uniqueness of the solution is proved by using the classical Faedo-Galerkin approximations, along with two a priori estimates. We prove an exponential stability estimate for problem under an unusual assumption, and by using a multiplier technique with frictional damping in the vertical displacement.</td>
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<th>ARTICLE TITLE</th>
<th>An Explicit Solution with Correctors for Variable Depth KdV and Camassa–Holm-like Equations</th>
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<td>JOURNAL</td>
<td>Journal of Engineering Mathematics</td>
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<td>PUBLICATION INFO</td>
<td>DOI: 10.1007/s10665-021-10158-8</td>
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<td>THEME / SUBTHEME</td>
<td>Science and Technology/ Mathematical and Computational Science</td>
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<tr>
<td>ABSTRACT</td>
<td>The aim of this paper is to study the water wave problem for uneven bottoms in a highly nonlinear regime. It is well known that, for such regimes, a generalization of the KdV equation called the Camassa-Holm equation can be derived and justified when the bottom is variable [Israwi in ESAIM: M2AN 44:347–370, 2010]. In this work, new asymptotic models are derived so that they have the same accuracy as the standard equations. We solve explicitly the new simple models and we validate numerically the results.</td>
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<tr>
<th>Author(S)</th>
<th>Abou Jmeih N., El Arwadi T., Dib S.</th>
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<th>Author(S)</th>
<th>El Arwadi T., Israwi S.</th>
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<th>Author(S)</th>
<th>Elhindi M., Zennir K., Ouchenane D., Choucha A., El Arwadi T.</th>
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Numerically, we construct a numerical scheme based on the P1P1-finite element method for space discretization and implicit Euler scheme for time discretization. Then, we showed that the discrete energy decays, later a priori error estimates are established. Finally, some numerical simulations are presented.

The phytochemical constituents were identified, and the antioxidant, antiinflammatory, antiacetylcholinesterase (AChE), cytotoxic, and anti-haemolytic properties were assessed for the leaves and stem extracts of Lebanese rose geranium extracted by four solvents with different polarity (ethanol, water, ethyl acetate, and chloroform). The highest amounts of total phenolics (237 GAE mg/g), total flavonoids (356 RE mg/g) and condensed tannins content (441 LE mg/g) were detected in the ethanolic leaves extracts. The antioxidant activity was estimated by four methods, namely DPPH radical scavenging, hydrogen peroxide scavenging, reducing power and β-carotene bleaching assays and the ethanolic leaves extract exhibited the superior antioxidant potential. On the other hand, the chloroform extracts revealed good anti-inflammatory activity. The ethanol and ethyl acetate leaves and stem extracts demonstrated the highest anti-AChE activity with 80% inhibition achieved at 5 mg/mL. The cytotoxic activity of the extracts was evaluated against HCT 116 colon cancer cells, with the chloroform leaves extract being the most potent with an IC50 of 0.4 mg/mL. The toxicity of the extracts was assessed by testing its ability to induce haemolysis of red blood cells, and the water leaves extract was the least toxic.
Comparative Study of Structural and Superconducting Properties of (Cu0.5Tl0.5)-1223 Phase Substituted by Copper Fluoride and Thallium Fluoride

A series of (Cu0.5−xTl0.5−y)-1223 superconductor samples, doped with varying amounts of (CuF2)x and (TlF)y compounds with x = y = 0.0, 0.1, 0.2, 0.3 and 0.4, were synthesized via a single-step solid-state reaction. X-ray diffraction (XRD) revealed that all the samples have a tetragonal symmetry of (Cu 0.5Tl0.5)-1223 phase. Additionally, with increasing fluorine content up to x = 0.2 CuF2 and y = 0.1 TlF, the phase fraction and the superconducting transition Tc were enhanced. The scanning electron microscopy (SEM) images exhibited mainly plate-like rectangular shape grains confirming the formation of (Cu 0.5Tl0.5)-1223 phase. The Fourier transform infrared (FTIR) spectra of CuF2- and TlF-substituted (Cu0.5−xTl0.5−y)-1223 show a slight softening and hardening in few peaks related to the apical oxygen atoms and CuO2 planar modes. The stoichiometry of elemental composition for all prepared samples has been confirmed using ion beam analysis (IBA) methods. The excess conductivity Δσ above Tc was analyzed through the Aslamasov–Larkin (AL) approach. Using the Ginzburg–Landau (GL) number (NG) and equations, the coherence length, the effective layer thickness, the lower critical field Bc1(0), the upper critical field Bc2(0) and the critical current density Jc(0) were estimated. It was found that the addition of an optimum concentration of CuF2 and TlF, controlled the microstructure, the grains coupling and hence enhanced the physical properties of (Cu0.5Tl0.5)-1223 phase.
**ARTICLE TITLE**
Crocin Suppresses Inflammation-Induced Apoptosis in rmTBI Mouse Model via Modulation of Nrf2 Transcriptional Activity

**JOURNAL**
PharmaNutrition

**YEAR**
2022

**PUBLICATION INFO**
DOI: 10.1016/j.phanu.2022.100308

**THEME / SUBTHEME**
Health and Wellbeing/ Human Disorders at the Molecular Level

**ABSTRACT**

**Background**
Repetitive mild traumatic brain injury (rmTBI) has been considered a serious health issue. Crocin, a bioactive carotenoid in Crocus sativus (saffron) is well known for its anti-inflammatory and anti-oxidant properties. The aim of this study is to investigate the neuroprotective role of crocin in a repetitive mild traumatic brain injury (rmTBI) mouse model and thus fits the pharmacological scope of pharmanutrition.

**Methods**
Balb c mice were divided into four groups, sham, crocin sham, TBI and crocin TBI. Injured groups received seven multiple closed brain injuries. Treated groups were injected with crocin (30 mg/kg) 30 min before each hit. Brain cortices were extracted 24 h post the last injury for molecular analysis. Brain cytokine levels of IL-6 and IL-10 were measured using ELISA. Also, using RT-PCR, the expression levels of the following genes, Bcl-2, caspase3, Bax, P53, NF-κB, Nrf2, HO-1 and NQO1 were assessed.

**Results**
There was a significant increase in the level of the inflammatory cytokine IL-6. Crocin administration induced a decrease in IL-6 accompanied with elevation in the anti-apoptotic factors caspase3, Bax, P53, NF-κB, Nrf2, HO-1 and NQO1 were assessed.

**Conclusion**
Crocin exerted its neuroprotective effect following rmTBI. Crocin proves to play a prospect role in conferring protection against concussions.

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**ARTICLE TITLE**
Dielectric, Impedance and Conductivity Properties of Pristine and (Gd, Ru)-Dual Doped NiO Nanoparticles

**JOURNAL**
Journal of Alloys and Compounds

**YEAR**
2022

**PUBLICATION INFO**
DOI: 10.1016/j.jallcom.2022.164952

**THEME / SUBTHEME**
Science and Technology/ Advanced Materials

**ABSTRACT**

This study investigates the synthesis of Ni1–2xGdxRuxO nanoparticles, with different concentrations of Gd and Ru dual dopants, in an attempt to improve their dielectric and electrical properties. These samples are synthesized via the co-precipitation method, and characterized by various structural, methods, including the X-Ray Diffraction (XRD), Transmission Electron Microscope (TEM), and Raman spectroscopy. The XRD patterns demonstrated the formation of single NiO phase, revealing the good incorporation of (Gd, Ru) in NiO lattice. The crystallite size decreased from 21 to 10 nm with increasing the dual dopants’ concentration. The TEM images demonstrated pseudo-spherical morphology of the Ni1–2xGdxRuxO nanoparticles and the Raman spectra detected the fundamental vibrational modes of NiO. The frequency and temperature-dependent dielectric constants were augmented by the incorporation of the dual dopants, due to the induced nickel vacancies and larger surface-to-volume ratio. The Nyquist plots demonstrated depressed semicircles with smaller radii as the temperature and the dual dopants’ concentration increased. This was related to the enhancement of ac conductivity that followed different trends at room and high temperatures. The ac conductivity was tuned by varying the dual dopants concentration due to the ionic compensation mechanism, and the changes in the charge carriers’ concentrations and mobility. The correlation between the different dielectric and electric parameters suggested the dominance of the long-range conduction of the charge carriers.
**ARTICLE TITLE**
EAPB0503, an Imidazoquinoline Derivative Modulates SENP3/ARF Mediated SUMOylation, and Induces NPM1c Degradation in NPM1 Mutant AML

**JOURNAL**
International Journal of Molecular Sciences

**YEAR**
2022

**PUBLICATION INFO**
DOI: 10.3390/ijms23073421

**THEME / SUBTHEME**
Health and Wellbeing/ Illness and Therapy

**ABSTRACT**
Nucleophosmin-1 (NPM1) is a pleiotropic protein involved in numerous cellular processes. NPM1 shuttles between the nucleus and the cytoplasm, but exhibits a predominant nucleolar localization, where its fate and functions are exquisitely controlled by dynamic post-translational modifications (PTM). Sentrin/SUMO Specific Peptidase 3 (SENP3) and ARF are two nucleolar proteins involved in NPM1 PTMs. SENP3 antagonizes ARF-mediated NPM1 SUMOylation, to promote ribosomal biogenesis. In Acute Myeloid Leukemia (AML), NPM1 is frequently mutated, and exhibits an aberrant cytoplasmic localization (NPM1c). NPM1c mutations define a separate AML entity with good prognosis in some AML patients, rendering NPM1c as a potential therapeutic target. SENP3-mediated NPM1 de-SUMOylation induces resistance to therapy in NPM1c AML. Here, we demonstrate that the imidazoquinoline EAPB0503 prolongs the survival and results in selective reduction in the leukemia burden of NPM1c AML xenograft mice. Indeed, EAPB0503 selectively downregulates HDM2 expression and activates the p53 pathway in NPM1c expressing cells, resulting in apoptosis. Importantly, we unraveled that NPM1c expressing cells exhibit low basal levels of SUMOylation paralleled with high SENP3 and low ARF basal levels. EAPB0503 reverted these molecular players by inducing NPM1c SUMOylation and ubiquitylation, leading to its proteasomal degradation. EAPB0503-induced NPM1c SUMOylation is concurrent with SENP3 downregulation and ARF upregulation in NPM1c expressing cells. Collectively, these results provide a strong rationale for testing therapies modulating NPM1c post-translational modifications in the management of NPM1c AML.

**ARTICLE TITLE**
Effect of a Commonly Used Veterinary Antibiotic on Oxidative Stress and Root Transporters of Edible Legumes and Leafy Crops

**JOURNAL**
BAU Journal-Science and Technology

**YEAR**
2022

**PUBLICATION INFO**
3(2): 1-20

**THEME / SUBTHEME**
Science and Technology/ Environmental Studies

**ABSTRACT**
Antibiotic accumulation in soil and plants is a rising problem in agriculture creating a serious threat to living organisms in the environment, hence needing huge attention. To this end, glasshouse pot experiments were conducted to simulate contamination by veterinary antibiotic at 150 mg kg−1 and 4800 mg kg−1 in a virgin soil in which lentil (Lens culinaris Medik.), chickpea (Cicer arietinum L.), arugula (Eruca sativa Mill.) and cress (Lepidium sativum L.) were grown, aiming at evaluating the potential toxicity of antibiotic in plants roots during their growth period. Biomarkers of toxicity such as malondialdehyde and proline levels and antioxidative enzyme activity (superoxide dismutase, SOD; catalase, CAT; and guaiacol peroxidase, POD) were analyzed in the roots of the four species. In addition, gene expression level of the antioxidant enzymes Cu/Zn-SOD and CAT4, IFS /IFR that are key enzymes in the isoflavone pathway, and four ABC transporters MRP2, MRP4, TT12, and PDR11 that are involved in detoxification processes were evaluated. Among all four vegetables, chickpea had the highest antioxidant activity with reduced lipid peroxidation in roots treated with the highest antibiotic concentration suggesting its antibiotic tolerance. Cu/Zn-SOD was not the key player in SOD activity. High antibiotic concentration inhibited the antioxidant activity in lentil, arugula, and cress implying their sensitivity. In treated arugula, SOD and POD activities decreased synergistically while CAT increased; whereas, in treated cress, POD and CAT were induced at low antibiotic concentration and inhibited with the high one. Gene expression displayed tolerance of chickpea and sensitivity of arugula to the antibiotic added. Our results reveal toxic effect of antibiotic on lentil, arugula, and cress with chickpea exhibiting higher tolerance to high antibiotic concentrations.
ARTICLE TITLE  Effect of Adoptive T cell Therapy on Colon Cancer Growth and Angiogenesis: An in vitro and in vivo Study

JOURNAL  Teikyo Medical Journal

YEAR  2022

PUBLICATION INFO  44(5): 1457-1472

THEME / SUBTHEME  Health and Wellbeing/ Human Disorders at the Molecular Level

ABSTRACT  Adoptive Cell Transfer (ACT) is a new type of immunotherapy that relies on boosting the ability of natural T cells to kill tumor cells. The aim of this study is to determine the effect of ACT and/or Sorafenib on colon cancer growth in vitro and on angiogenesis in vivo. HCT 116 and p53-/- cells were cultured in vitro and treated with different concentrations of either CD8 T cells isolated from the PBMC of 2 healthy individuals or Sorafenib. The effect of both treatments on both cell lines was assessed using MTT. Colon cancer was induced using DMH injections in Balb/c. The mRNAs from the homogenized colonic tissues of chemotherapeutic and immunotherapeutic-treated mice were transcribed and quantified using RT-PCR. Results show that the IC50 of Sorafenib against HCT 116 and HCT 116 p53-/- cells was 50 and 35 µM, respectively. The IC50 of CD8 T cells in both cell lines was 10±1. In vivo, Sorafenib and/or ACT significantly decreased the expressions of c-MYC (12-16 folds, p value <0.01), cyclin-D1 (18 folds, p value <0.001), PDGF-β (5-7 folds, p value <0.05), PDGF α (2-4 folds, p value <0.01) and β (3-6 folds, p value <0.001) receptors as compared to the untreated mice. Treatments significantly increased the expressions of CDC-4 by around 3 folds (p value <0.05) and non-significantly elevated the expressions of caspase-9 by 0.5 folds (p value >0.05) as compared to untreated mice. ACT can be used as a substitute or an adjunct to chemotherapy in colon cancer treatment.

ARTICLE TITLE  Effect of a Veterinary Antibiotic on the Growth of Regularly Consumed Lebanese Plants

JOURNAL  Spanish Journal of Agricultural Research

YEAR  2022

PUBLICATION INFO  DOI: 10.5424/sjar/2022202-18132

THEME / SUBTHEME  Science and Technology/ Environmental Studies

ABSTRACT  Aim of Study  To investigate the effect of a combined commercial veterinary antibiotic, commonly sold, in different concentrations, on Lens culinaris Medik., Cicer arietinum L., Eruca sativa Mill. and Lepidium sativum L., on germination rates, plant growth traits and rhizospheric bacterial size and diversity.

Area of Study  Lebanon, soil origin from South Lebanon

Material and Methods  The antibiotic phytotoxicity was assayed using seed germination and plant growth tests in a pot experiment conducted in a controlled glasshouse. Rhizospheric bacteria were isolated and identified by assisted laser desorption/ionization spectrometry (MALDI-TOF).

Main Results  The antibiotic used was species-dependent and negatively affected the plant growth variables causing decrease in root growth and total biomass weight. Regarding crop species, the antibiotic impact was dose-dependent. Arugula and cress were found to be the most sensitive in the tested concentrations, affecting their productivity. In lentil and chickpea, the effects disappeared after the fourth and the first week respectively. In addition, root microbial community was negatively affected in the first 4 weeks in lentil and chickpea. A diversity of growth promoting rhizobacterial genera were identified where some rhizospheric bacteria were more sensitive, while others were resistant to the used antibiotic concentrations.

Research Highlights  Results highlight the presence of resistant bacteria even in virgin soils. They implicate that the presence of anti-biotics in soil leads to biomass reduction in leafy species decreasing the productive capacity of the crops and draw attention to possible transmission to humans consuming these leaves.
<table>
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<tr>
<th>ARTICLE TITLE</th>
<th>Effects of Different Nano Size and Bulk WO3 Enriched by HDPE Composites on Attenuation of the X-ray Narrow Spectrum</th>
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<tr>
<td>JOURNAL</td>
<td>Nuclear Technology and Radiation Protection</td>
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<td>YEAR</td>
<td>2022</td>
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<td>PUBLICATION INFO</td>
<td>36(4): 315-328</td>
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<td>THEME / SUBTHEME</td>
<td>Science and Technology/ Advanced Materials</td>
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<tr>
<td>ABSTRACT</td>
<td>The X-rays of the narrow-spectrum N-series ranging from 40 kV to 150 kV were used to determine the radiation attenuation ability of a new category of a polymer composite fabricated for shielding purposes. High density polyethylene was synthesized through a compression molding technique, and incorporated with various filler amounts (10, 15, 25, and 35 wt.%) of bulk micro-sized WO3 (Sample A), two WO3 nanoparticles 45 nm (Sample B), and 24 nm (Sample C). The WO3 filler was identified and characterized using X-ray diffraction and a transmission electron microscope. The mass distribution of the chemical elements of the synthesized composites was determined by energy dispersive X-ray analysis. The obtained results of the different attenuation parameters revealed that the particle size and weight fraction of WO3 particles have an outstanding effect on the X-ray shielding ability of this composite. The 3 experimental measurements of the mass attenuation coefficients were compared to the theoretical values tabulated in the NIST databases XCOM and FFAST. The mass attenuation coefficient was increased with the increment of WO3 wt. % as well as with the decrease of the WO3 particle size. This improvement in the attenuation parameters of the NP(C) composite suggests their promising applications in radiation protection at the diagnostic level.</td>
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<tr>
<th>ARTICLE TITLE</th>
<th>Effect of Dust Accumulation on Quercus cerris L. Leaves in the Ezer Forest, Lebanon</th>
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<td>JOURNAL</td>
<td>IForest</td>
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<td>YEAR</td>
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<td>PUBLICATION INFO</td>
<td>15(4): 322-330</td>
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<tr>
<td>THEME / SUBTHEME</td>
<td>Health and Wellbeing/ Industrial and Medical Microbiology</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>Air pollution arising from different sources represents a serious environmental threat to all living organisms, including vegetation. Monitoring air contamination levels is necessary to detect pollution levels, regulate atmospheric pollution, and ultimately improve ambient air quality. The current study evaluated the effects of air pollutants with a focus on dust and some biochemical and physiological properties of Quercus cerris L., which is growing in Lebanon’s Ezer forest, threatened by the presence of a public road on its northern side. The studied parameters include leaf extract pH, stomatal conductance, relative water content, hydrogen peroxide, proline, carotenoids, and air pollution tolerance index. These parameters can provide reliable information about the tolerance status of plants towards pollutants. Three sites with different exposure to vehicular activities were used to conduct this study, including a control site (unpolluted) and two polluted sites (S1 and S2). The results showed a significant reduction in stomatal conductance and relative water content at polluted sites compared with the control site. Hydrogen peroxide, proline, and carotenoids showed the highest levels at the S2 site, which is indicative of the fact that Quercus cerris undergoes established physiological and biochemical changes in response to environmental stress. Based on the air pollution tolerance index (4.97–9.85) Quercus cerris is categorized as a sensitive species that can be used as a biological monitor of environmental pollution. Thus, the development and implementation of efficient environmental action plans based on biomonitoring should be considered for protecting the forests.</td>
</tr>
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</table>
### ARTICLE TITLE

*Efficiency Calibration and Coincidence Summing Correction for a NaI(Tl) Spherical Detector*

### JOURNAL

*Nuclear Engineering and Technology*

### YEAR

2021

### PUBLICATION INFO

53(10): 3421-3430

### THEME / SUBTHEME

Science and Technology/ Advanced Materials

### ABSTRACT

Spherical NaI(Tl) detectors are used in gamma-ray spectrometry, where the gamma emissions come from the nuclei with energies in the range from a few keV up to 10 MeV. A spherical detector is aimed to give a good response to photons, which depends on their direction of travel concerning the detector center. Some distortions in the response of a gamma-ray detector with a different geometry can occur because of the non-uniform position of the source from the detector surface. The present work describes the calibration of a NaI(Tl) spherical detector using both an experimental technique and a numerical simulation method (NSM). The NSM is based on an efficiency transfer method (ETM, calculating the effective solid angle, the total efficiency, and the full-energy peak efficiency). Besides, there is a high probability for a source-to-detector distance less than 15 cm to have pulse coincidence summing (CS), which may occur when two successive photons of different energies from the same source are detected within a very short response time. Therefore, γ-γ ray CS factors are calculated numerically for a $^{152}$Eu radioactive cylindrical source. The CS factors obtained are applied to correct the measured efficiency values for the radioactive volumetric source at different energies. The results show a good agreement between the NSM and the experimental values (after correction with the CS factors).

### AUTHOR(S)

Noureddine S., Abbas M., Badawi M.

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### ARTICLE TITLE

*Enhancement of the Magnetic and Optical Properties of Ni$_{0.5}$Zn$_{0.5}$Fe$_{2-x}$O$_4$ Nanoparticles by Ruthenium Doping*

### JOURNAL

*Applied Physics A: Materials Science and Processing*

### YEAR

2022

### PUBLICATION INFO

DOI: 10.1007/s00339-022-05552-7

### THEME / SUBTHEME

Science and Technology/ Advanced Materials

### ABSTRACT

The characterization of Nanosized Ni$_{0.5}$Zn$_{0.5}$Ru$_x$Fe$_{2-x}$O$_4$ (0.00 ≤ x ≤ 0.015), prepared by the wet chemical coprecipitation method, is reported in the current investigation. X-ray powder diffraction (XRD) analysis has confirmed the formation of a single phased spinel cubic structure. While transmission electron microscopy (TEM) studies have shown an increase in the particle size for high content of Ru$^{3+}$ doping. The elemental composition of all samples was investigated using energy dispersive x-ray (EDX) measurements. The results showed a reciprocal relation between the Fe$^{3+}$ and Ru$^{3+}$ contents, suggesting the successful substitution of Ru$^{3+}$ in Fe$^{3+}$ sites. UV–Vis spectroscopy studies, via Urbach energy analysis, proposed a perturbation in the band structure of Ni$_{0.5}$Zn$_{0.5}$Ru$_x$Fe$_{2-x}$O$_4$ induced by Ru$^{3+}$ substitution, affecting both the direct and indirect bandgap energies. Excitation wavelength-dependent photoluminescence (PL) studies, presented for the first time, have shown a strong dependence of the emission spectra on both the excitation wavelength and Ru$^{3+}$ doping. The PL analysis suggests the utilization of Ni$_{0.5}$Zn$_{0.5}$Ru$_x$Fe$_{2-x}$O$_4$ as a candidate for photocatalytic applications. Furthermore, VSM studies, have shown a transition from superparamagnetic to soft ferromagnetic for Ru$^{3+}$ doped samples. The saturation magnetization, coercivity, and effective anisotropy were enhanced as a result of Ru$^{3+}$ doping. Finally, photocatalysis experiments have shown an enhancement of the degradation rate of nitrobenzene for the sample with x = 0.0125 with the ability of magnetic recycling, in agreement with the PL and VSM studies.

### AUTHOR(S)


**ABSTRACT**

High-density polyethylene (HDPE) composite has been synthesized with promising characteristics. WO3 of different particle sizes were obtained through a high speed ball milling techniques at different milling times (15 min, 30 min, 60 min, and 120 min). The resulted particle size was identified using X-ray diffraction and transmission electron microscope and was found to be decreased with the increase of milling time. Bulk micro-sized WO3 (Sample A) and two selected WO3 nanoparticles 45 nm (Sample B) and 24 nm (Sample C) were characterized by scanning electron microscope, energy dispersive X-ray and Fourier transform infrared spectroscopy. Various amounts (10 mass%, 15 mass%, 25 mass%, and 35 mass%) of filler (Samples A, B, and C) were incorporated within HDPE and prepared via compression molding technique. The effect of particle size and mass fraction of the composite was evaluated using thermogravimetric analysis and differential scanning calorimeter (DSC). The results indicated that the addition of WO3 particles altered the thermal stability and crystallinity, while did not affect the melting temperature HDPE composites. The incorporation of either nano-sized particles WO3 NPs(B) or (C) up to 25 mass% enhanced the thermal stability of the composites. With respect to pure HDPE, DSC results indicated that the degree of crystallinity increased by the incorporation of WO3 filler due to the nucleation of HDPE. This improvement in the thermal properties of the nanocomposites suggests promising applications in radiation shielding and industry such as coating, barriers, catalysis, photo corrosion, and photothermal conversion.
Objective
Recent studies shed the light about the implication of exosomes as biomarkers in various diseases. In this preliminary study, we investigated the serum exosomal microRNA (miRNA) profiles in relapsing-remitting multiple sclerosis (RRMS) patients and healthy subjects from the Bekaa region of Lebanon.

Methods
Next generation sequencing (NGS) technique was used to establish the serum exosomal miRNA profiles in 3 RRMS patients in the remission state and 3 healthy subjects. Near to 1250 miRNAs were detected in all exosomal samples with a yield of 13 to 14 million reads. Bioinformatics analysis consisted of detailed analysis of differentially expressed miRNAs as well as target genes predicted.

Results
Data analysis revealed that 12 miRNAs were differentially expressed between RRMS patients and controls. Among them, 6 were upregulated (miR-330-5p, let-7i-5p, miR-3529-3p, miR-182-5p, miR-3184-5p and miR-7-5p, and 6 were downregulated (miR-223-3p, miR-199b-5p, miR-542-3p, miR-582-5p, miR-520c-5p and miR-7641) in RRMS patients in comparison to controls.

Conclusion
Our data support the evidence that circulating exosomal miRNAs may serve as powerful biomarkers in MS especially in discriminating between RRMS patients and controls.
ARTICLE TITLE
Hawthorn, A Promising Plant with Diverse Biomedical Applications

JOURNAL
Bacterial Empire

YEAR
2022

PUBLICATION INFO
5(2): 335-339

THEME / SUBTHEME
Science and Technology/ Environmental Studies

ABSTRACT
Hawthorn (Crataegus species) is distributed widely in Asia, North America and Europe. The fruits and leaves of hawthorn have been used to treat many health conditions. Many in vivo and in vitro studies have been carried out for its biomedical applications. Hawthorn extract possesses a range of different activities including, antioxidant, antibacterial, anti-inflammatory, anti-cataract, hypolipidemic, hypotensive, and anticancer activities. The present review aims to give a detailed understanding of the morphology, chemical composition, pharmacological and biomedical activities of Hawthorn. Phytochemicals like flavonoids, procyandins, catecholamines, polysaccharides, triterpenes, have been identified evaluated for biological activities. In addition, this review discusses the clinical trials of various Crataegus plants along with the scope for future research in this aspect.

ARTICLE TITLE
How Light Polarizations Affect the Localized Surface Plasmon Resonance of Asymmetric Palladium Nanostructures

JOURNAL
Nano

YEAR
2022

PUBLICATION INFO
DOI: 10.1142/S1793292022500515

THEME / SUBTHEME
Science and Technology/ Advanced Materials

ABSTRACT
Diverse spectroscopy techniques and advances imaging are elucidated when employing light in a controlled manner. One of the features of the light focusing fields is the localized surface plasmon resonance (LSPR). In this paper, we study the LSPRs for different arrangements of palladium (Pd) nanostructures with respect to light polarization in the visible and near-infrared regions. The extinction cross-section spectrum of asymmetric nanostructures is measured using far field spectroscopy technique and is calculated using Finite Element Method (FEM). The spectra of the nanostructures various arrangements recorded from the two methods are in very good agreement. Depending on the light polarization, the nanostructures produce strong plasmonic coupling. This is represented by the induction of dipole and quadrupole LSPR modes. A clear enhancement of the extinction spectrum has been evidenced by increasing the number of particles of nanostructures. The main advantage of the transition metallic nanostructures of different arrangements lies in the generation of a highly enhanced electromagnetic field accompanied by a redshift of LSPR spectrum that can be exploited in diverse applications.

ARTICLE TITLE
Improvement in the Between-Class Variance Based on Lognormal Distribution for Accurate Image Segmentation

JOURNAL
Entropy

YEAR
2022

PUBLICATION INFO
DOI: 10.3390/e24091204

THEME / SUBTHEME
Science and Technology/ Software and Computing

ABSTRACT
There are various distributions of image histograms where regions form symmetrically or asymmetrically based on the intensity levels inside the image. In pure image processing, the process of optimal thresholding tends to accurately separate each region in the image histogram to obtain the segmented image. Otsu’s method is the most used technique in image segmentation. Otsu algorithm performs automatic image thresholding and returns the optimal threshold by maximizing between-class variance using the sum of Gaussian distribution for the intensity level in the histogram. There are various types of images where an intensity level has right-skewed histograms and does not fit with the between-class variance of the original Otsu algorithm. In this paper, we proposed an improvement of the between-class variance based on lognormal distribution, using the mean and the variance of the lognormal. The proposed model aims to handle the drawbacks of asymmetric distribution, especially for images with right-skewed intensity levels. Several images were tested for segmentation in the proposed model in parallel with the original Otsu method and the related work, including simulated images and Medical Resonance Imaging (MRI) of brain tumors. Two types of evaluation measures were used in this work based on unsupervised and supervised metrics. The proposed model showed superior results, and the segmented images indicated better threshold estimation against the original Otsu method and the related improvement.
**Article 1**

**Author(s):** Jumiawi W., El-Zaart A.

**ARTICLE TITLE:** Improving Minimum Cross-Entropy Thresholding for Segmentation of Infected Foregrounds in Medical Images Based on Mean Filters Approaches

**JOURNAL:** Contrast Media and Molecular Imaging

**YEAR:** 2022

**PUBLICATION INFO:** DOI: 10.1155/2022/9289574

**THEME / SUBTHEME:** Science and Technology/ Software and Computing

**ABSTRACT:** Mean-based thresholding methods are among the most popular techniques that are used for images segmentation. Thresholding is a fundamental process for many applications since it provides a good degree of intensity separation of given images. Minimum cross-entropy thresholding (MCET) is one of the widely used mean-based methods for images segmentation; it is based on a classical mean that remains steady and limited value. In this paper, to improve the efficiency of MCET, dedicated mean estimation approaches are proposed to be used with MCET, instead of using the classical mean. The proposed mean estimation approaches, for example, alpha trim, harmonic, contraharmonic, and geometric, tend to exclude the negative impact of the undesired parts from the mean computation process, such as noises, local outliers, and gray intensity levels, and then provide an improvement for the thresholding process that can reflect good segmentation results. The proposed technique adds a profound impact on accurate images segmentation. It can be extended to other applications in object detection. Three data sets of medical images were applied for segmentation in this paper, including magnetic resonance imaging (MRI) Alzheimer’s, MRI brain tumor, and skin lesion. The unsupervised and supervised evaluations were used to conduct the efficiency of the proposed method.

**Article 2**

**Author(s):** Abdallah A., Awad R.

**ARTICLE TITLE:** Influence of Ru Dopants on the Structural, Optical, and Magnetic Properties of Nickel Oxide Nanoparticles

**JOURNAL:** Physica B: Condensed Matter

**YEAR:** 2022

**PUBLICATION INFO:** DOI: 10.1016/j.physb.2021.413651

**THEME / SUBTHEME:** Science and Technology/ Advanced Materials

**ABSTRACT:** The co-precipitation method was adopted to synthesize Ni1-xRuxO nanoparticles, with x = 0.000, 0.005, and 0.010. The X-Ray Diffraction patterns showed the formation of the NiO phase without any secondary phases or impurities due to the doping. The Ru-dopants are well incorporated into the lattice without changing its structural properties, owing to the comparable ionic radii of Ru3+ and Ni2+ ions. The doped samples have cubic morphology with reduced sizes, as seen in Transmission Electron Microscope images. The Fourier Transform Infra-Red and X-Ray Photo-induced spectra (XPS) assured the purity and the successful doping of trivalent Ru ions into NiO nanoparticles. Moreover, the XPS spectra revealed the generation of more oxygen vacancies with Ru-doping. The optical properties were investigated by Ultra-Violet and Photoluminescence (PL) spectroscopies. The Ru-doped samples have higher transmittance that is beneficial for transparent electrodes and optoelectronic devices. The TAUC and derivative plots were used to estimate the bandgap energies. The Ru-doped samples demonstrated suppressed bandgap energies, mainly due to the formation of additional energy levels near the valence band. The visible region of the PL spectra was investigated to track the deep-level defects. All the samples have traces of nickel vacancies, oxygen vacancies, and oxygen interstitials. The magnetic studies were tested by Vibrating Sample Magnetometer at room temperature. The M – H loops were then fitted by the different models of the law of approach to saturation. The best-fitted model was the one accounting for the exchange and anisotropy fields. The pure and Ru-doped samples showed a weak ferromagnetic behavior with a slight increase in the linear magnetization with Ru dopants, due to the antiferromagnetic Ru–Ru interactions.
Influence of Zn Doping on the Structural, Optical, and Magnetic Properties of CuO Nanoparticles and Evaluation of Its Anti-corrosive Behavior of Mild Steel in Acidic Medium

Journal of Bio- and Tribo-Corrosion

DOI: 10.1007/s40735-022-00696-8

Herein, the co-precipitation method is used to synthesize pure and Zn-doped copper oxide (CuO) nanoparticles with low concentrations, 0.5, 0.75, 1, and 1.25 at.% capped by ethylenediaminetetraacetic acid. The influence of Zn doping on the structural, morphological, optical, and magnetic properties is characterized. X-ray powder diffraction patterns confirm the formation of the monoclinic CuO phase without any impurities. In addition, the Zn dopant revealed the formation of mixed morphology welded with some elongated and small agglomerated nanoparticles. Fourier transform infrared spectra affirm the successful formation of the CuO monoclinic structure. The optical properties were examined in ethanol and propanol solvents, which demonstrated a dependence on the excitation, emission, and solvent. Consequently, the crystallite size and energy band gap are both found to decrease for 0.5 at.% Zn dopant and then increase for the highest concentrations. Furthermore, M–H loops reveal the presence of paramagnetic behavior with weak ferromagnetic nature at the low field with Zn doping. Accordingly, the anti-corrosion behavior of the prepared nanoparticles has been studied. They have 83% corrosion inhibition on mild steel in 0.5 M HCl which is confirmed by impedance and polarization studies.

Infrared Spectroscopy and Excess Conductivity Analysis for \((\text{Y}_3\text{Fe}_5\text{O}_{12})_x/\text{Cu}_0.5\text{Tl}_0.5\text{Ba}_2\text{Ca}_2\text{Cu}_3\text{O}_{10-\delta})\) Composites

Brazilian Journal of Physics

DOI: 10.1007/s13538-022-01183-8

In this study, the influence of adding Yttrium iron garnet (\(\text{Y}_3\text{Fe}_5\text{O}_{12}\)) nanoparticles [NPs] on the microstructure and fluctuation-induced conductivity (FIC) of \(\text{Cu}_0.5\text{Tl}_0.5\text{Ba}_2\text{Ca}_2\text{Cu}_3\text{O}_{10-\delta}\) \((\text{CuTl-1223})\) superconductor was studied. \(\text{Y}_3\text{Fe}_5\text{O}_{12}\) NPs were produced by the co-precipitation technique. By solid state route, \((\text{Y}_3\text{Fe}_5\text{O}_{12})_x/\text{Cu}_0.5\text{Tl}_0.5\text{Ba}_2\text{Ca}_2\text{Cu}_3\text{O}_{10-\delta})\) composites, with \(x = 0.00, 0.02, 0.04, 0.06, 0.08, \) and 0.10 wt. % were prepared. The tetragonal unit cell parameters of \((\text{Y}_3\text{Fe}_5\text{O}_{12})_x/\text{Cu}_0.5\text{Tl}_0.5\text{Ba}_2\text{Ca}_2\text{Cu}_3\text{O}_{10-\delta})\) composites were found to be invariable with \(\text{Y}_3\text{Fe}_5\text{O}_{12}\) content. The volume fraction of the host phase was increased with \(\text{Y}_3\text{Fe}_5\text{O}_{12}\) addition till \(x = 0.04\) wt. %. The different vibrational modes of the samples were identified through Fourier transform infrared spectroscopy (FTIR). The transition from normal to the superconducting state, for the prepared composites, was done through d.c. resistivity measurements from room temperature down to zero critical temperature \((T_0)\). The Aslamazov–Larkin (AL) model was used to examine fluctuation regions in resistivity-temperature curves. At high temperatures, short wave fluctuation was observed. A cross-over between short wave fluctuation and the mean-field region was spotted at lower temperatures. The mean field region for the examined composites was composed of two-dimensional fluctuations along with one-dimensional fluctuation. The coherence length along the c-axis \((\text{\(\xi\)}(0))\), interlayer coupling \((J)\), and anisotropy parameter \((\gamma)\) were estimated from the Lawrence–Doniach (LD) model as a function of \(\text{Y}_3\text{Fe}_5\text{O}_{12}\) content.
Investigation of the Structural and Electrical Properties of CdO/(Bi, Pb)−2212 Superconducting Phase

This investigation reports the effect of the addition of CdO nanoparticles on the (Bi, Pb)−2212 superconducting phase. The superconducting samples of general formula \((\text{CdO})_x \text{Bi}_{1.6} \text{Pb}_{0.4} \text{Sr}_{1.9} \text{Ca}_{1.1} \text{Cu}_{2.1} \text{O}_8\) \((x = 0.00, 0.01, 0.02, 0.05, \text{and } 0.1 \text{ wt%})\) are synthesized using the conventional solid-state reaction technique. Powder x-ray diffraction analysis confirms the formation of a single-phase orthorhombic Bi-2212. The variations in the lattice parameters are explained based on the Jahn Teller distortion induced by the increase in the oxygen content owing to the addition of the CdO nanoparticles. The increase in the oxygen content is confirmed via idiomatic titration analysis. The grain morphology is investigated using scanning electron microscopy (SEM). The effect of CdO addition in enhancing grains connectivity by the filing of pores and voids is revealed. Fourier transform infrared (FTIR) spectroscopy is conducted to analyze the functional groups, based on the effect of calcination temperature and CdO addition. Dc-electrical resistivity measurements and I-V characteristics show an enhancement of the superconducting transition temperature \((T_c)\) and the critical current density \((J_c)\) with CdO addition up to \(x = 0.05 \text{ wt%}\), followed by a further decrease. By analyzing the results of the x-ray photoelectron spectroscopy (XPS), the variations of the superconducting properties are explained based on the preferred substitution of \(\text{Pb}^{2+}\) ions in the \(\text{Bi}^{3+}\) or \(\text{Cu}^{2+}\) sites induced by the variations in the oxygen content generated by the addition of CdO nanoparticles.

Knowledge, Attitudes, and Practices Regarding the Use of Antibiotics: A Cross-Sectional Study from a Rural Area of Lebanon

Despite the presence of a national policy restricting the easy access to antibiotics, irrational use of antibiotics continues to be widespread both in human use and livestock production in Lebanon. This study targets the general population in the rural region of Bekaa to assess their knowledge, attitudes and practices (KAP) towards antibiotic use. A cross sectional questionnaire was completed by 1151 participants, through face-to-face interviews. Study population was randomly selected. Descriptive statistics and correlation tests were applied in data analysis. 67.2% of participants had a very poor knowledge about antibiotics. More than 70% believed that viral infections may be treated by antibiotics; interrupting therapy when conditions improve and sharing antibiotics were considered appropriate by 79.4% and 80.3%, respectively. Only 14.1% were aware of the concept of “antibiotic resistance” and 58.3% didn't know that antibiotics were used in animals. Despite their poor knowledge, more than half of participants (55.2%) expressed good attitude in terms of need for prescriptions (79.1%) when needed only (89.5%) and on the minimal use in agriculture (74%). Such positive attitude was generally reflected by their overall moderate practice among participants (65.8%). Nevertheless, only 10.9% of the participants obtained their antibiotics through a prescription, 62.7% kept leftover antibiotic for future use and 83.2% interrupted their antibiotic treatment. Moreover, participants’ attitudes and practices were significantly associated with gender, age and educational level. However, knowledge was associated only with gender and education. Knowledge showed significant positive correlation with attitude and practice. Findings suggest that intervention awareness programs specifically targeting specific segments in rural regions can be effective in directing the public to the rational use of antibiotics. Further research is recommended by conducting nationwide KAP studies covering communities of both urban and rural regions.
**ARTICLE TITLE**

Matricaria chamomilla: A Valuable Insight into Recent Advances in Medicinal Uses and Pharmacological Activities

**JOURNAL**

Phytochemistry Reviews

**YEAR**

2022

**PUBLICATION INFO**

DOI: 10.1007/s11101-022-09817-0

**THEME / SUBTHEME**

Health and Wellbeing/ Human Disorders at the Molecular Level

**ABSTRACT**

Throughout history, Matricaria chamomilla L. (M. chamomilla) has had countless applications in traditional medicine. Its extracts, oils and teas have been used for treating diverse ailments, including wounds, rheumatic pain, menstrual cramps, eye and ear infections, gastrointestinal disorders, and respiratory illnesses. These traditional applications guided modern research into its medicinal effects through increasingly detailed in vitro and in vivo studies and clinical trials. A plethora of preclinical studies have assessed the antimicrobial, antioxidant, anti-inflammatory, antiulcer, hypoglycemic, hypolipidemic, cardioprotective, hepatoprotective, neuroprotective, nephroprotective, anti-diarrheal, antispasmodic, wound healing, and anticancer properties of M. chamomilla. These pharmacological properties of M. chamomilla are attributed to its rich reservoir of phytochemical constituents, primarily its flavonoids, such as luteolin, apigenin, and quercetin, as well as its sesquiterpenes, mainly chamazulene and -(−)-α-bisabolol. Remarkably, preclinical studies have paved the way for progress towards controlled human clinical trials. M. chamomilla has been clinically evaluated for its effects against anxiety, sleep-deficiency, depression, as well as oral, women-related, inflammatory, metabolic, dermatological, gastrointestinal disorders, and children-related conditions. In this sense, this review elucidates and discusses the recent findings for M. chamomilla development as a therapeutic agent that possesses health-promoting, disease-preventing and even treatment properties. The traditional medicinal uses and evidence-based research studies, which were performed in cell culture, animal models and human subjects to assess the pharmacological activities of M. chamomilla, are extensively highlighted. Particular emphasis is given to some phytochemical constituents of M. chamomilla, which demonstrate great potential in treating various conditions.

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**ARTICLE TITLE**

Measurements Correlated to Efficiency Studies of NaI(Tl) Scintillator with Vertical Hexagonal Radioactive Source

**JOURNAL**

Journal of Instrumentation

**YEAR**

2021

**PUBLICATION INFO**

DOI: 10.1088/1748-0221/16/07/P07011

**THEME / SUBTHEME**

Science and Technology/ Advanced Materials

**ABSTRACT**

Nowadays, many scientists work on the geometry change between source-to-detector arrangement to calibrate the 3”×3” γ-ray NaI(Tl) detector based on the available sample shape in the laboratory. The calculated full-energy peak efficiency is more sensitive in radiation activity determination and can be estimated build on complex analytical and numerical techniques. In the present study, the full-energy peak and total efficiencies beside the peak-to-total ratio (P/T) for γ-ray NaI(Tl) detector concerning vertical hexagonal \(^{152}\text{Eu}\) radioactive source is calculated for all γ-rays involved in the cascade and estimate the suitable correction for coincidence summing effects (COI) by mean of the numerical simulation method (NSM). The extra factors which cause the γ-ray attenuation taken into consideration as well, such as, source composition materials, «self-attenuation within the source itself», the detector end cap with the other supporting materials around the detector crystal, the source container material, and the holder used during the measurement process. The theory of this methodology depends on the efficiency transfer technique; calculate the effective solid angle, that be positioned in between the source-to-detector system, besides estimating the path lengths of the γ-rays inside the hexagonal \(^{152}\text{Eu}\) radioactive sources and the active medium inside the detector itself as well. The results gained in the present work gave an agreement between simulation and measured data. The results show that to improve the accuracy of the γ-rays detector efficiency, many technical and methodological aspects of the present method are fitting and possible for applications inside the radiation laboratory, industrial, and medical sectors.
Microsatellite Instability in Near East Sebaceous Neoplasms: Toward Improved Prediction

**JOURNAL**
Applied Immunohistochemistry and Molecular Morphology

**YEAR**
2021

**PUBLICATION INFO**
30(3): 204-208

**THEME / SUBTHEME**
Health and Wellbeing/ Human Disorders at the Molecular Level

**ABSTRACT**
Sebaceous neoplasms (SN) comprise a heterogeneous spectrum of tumors with different biological behaviors. In the Near-East Region (NER), microsatellite instability (MSI) in SNs development, and its correlation with the clinicopathologic features of tumors is not well elucidated. A cohort of 225 SN patients (40 benign SNs and 185 sebaceous carcinomas) from the NER was retrospectively reviewed. Clinical variables and available follow-up information were recorded. MSI proteins (MLH1, MSH2, MSH6, and PMS2) as well as P53, P16, EMA, CD8, and PDL-1 expressions were examined by immunohistochemistry. Detection of human papilloma virus was determined by polymerase chain reaction. Microscopic features such as mitotic count and tumor-infiltrating lymphocytes were documented. A minority of SNs from benign (n=2) or malignant (n=3) tumors in the NER exhibit MSI (2.2%). MSI is exclusively found in patients with extraocular lesions (back, n=5) and presented a poor outcome. Among these, PMS2 protein was mostly lost (average=80%, n=4). SN with MSI exhibited a significant increase in p53 expression, (average=62.10%, P=0.002). There was no significant correlation between MSI status and any of the following: PD-L1, CD8, p16, and human papilloma virus infection. Microscopically, SN with MSI show significantly higher mitotic count, cystic changes and increased tumor-infiltrating lymphocytes. MSI is rarely found in NERs SN. When detected, it is exclusively in extraocular SNs with minimal predacutive microscopic features and worse outcome.

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Mixed Magnetic Behavior in Gadolinium and Ruthenium Co-doped Nickel Oxide Nanoparticles

**JOURNAL**
Physica Scripta

**YEAR**
2022

**PUBLICATION INFO**
DOI: 10.1088/1402-4896/ac46f2

**THEME / SUBTHEME**
Science and Technology/ Advanced Materials

**ABSTRACT**
Pure and different concentrations from (Gd, Ru) co-doped NiO nanoparticles, capped with Polyvinylpyrrolidone (PVP), were fabricated by the co-precipitation method. The nanoparticles were characterized by different techniques. The Rietveld refinements of x-ray Diffraction (XRD) patterns confirmed the formation of the pure face-centered-cubic NiO phase. The x-ray Photo-induced Spectroscopy (XPS) assured the trivalent oxidation state of the doped ions Gd3+ and Ru3+ and unveiled the multiple oxidation states of nickel ions (Ni2+ and Ni3+), emerging from the vacancies in the samples. The Transmission Electron Microscope (TEM) images showed the pseudospherical morphology of the samples and the Energy Dispersive x-ray permitted the quantitative analysis of the presented elements and their homogeneous distribution. The Raman and Fourier Transform Infra-Red (FTIR) spectra depicted the fundamental vibrational bands of NiO nanoparticles, confirming their purity. The UV-visible spectroscopy enabled the absorption measurements and the energy gap calculations. The co-dopants increased the energy bandgap of NiO nanoparticles from 3.15 eV for pure NiO to 3.62 eV with the highest concentration of the co-dopants (x = 0.02). The photoluminescence (PL) spectra gave insights into the possible defects present in the samples, such as nickel vacancies, single and double oxygen vacancies, and oxygen interstitials. The Vibrating Sample Magnetometer (VSM) studied the room temperature M-H loops of the co-doped samples. A combination of ferromagnetic, antiferromagnetic, and paramagnetic contributions was noticed and treated according to the law of approach to saturation and bound magnetic polaron (BMP) model. The magnetic parameters, such as the saturation magnetization, exchange and anisotropy field, and the BMP concentration were extracted from the fitted models and discussed in terms of the co-dopants’ concentration. The co-doped samples showed a softer magnetic behavior, which is recommended for data storage applications.
<table>
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<tr>
<th>Author(S)</th>
<th>Numerical Analysis and Simulation for a Wave Equation with Dynamical Boundary Control</th>
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<td>JOURNAL</td>
<td>Journal of Scientific Computing</td>
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<tr>
<td>YEAR</td>
<td>2021</td>
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<td>PUBLICATION INFO</td>
<td>DOI: 10.1007/s10915-021-01408-z</td>
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<td>THEME / SUBTHEME</td>
<td>Science and Technology/ Mathematical and Computational Science</td>
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<td>ABSTRACT</td>
<td>This paper is concerned with a theoretical and numerical analysis for the stability of a vibrating beam of finite length which is fixed at one end and free at the other end and with a dynamical boundary control. On the theoretical results, we prove the existence and uniqueness of global solutions, and the stability of the total energy. Furthermore, we introduced a numerical method based on finite element discretization in a spatial variable and finite difference scheme in time. Error estimates for the semi-discrete and fully discrete schemes are provided and numerical experiments performed. From the numerical results, the rate of convergence are shown to be consistent with the order of convergence expected from the theoretical ones.</td>
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<tr>
<th>Author(S)</th>
<th>On The Faithfulness of the Extension of Lawrence-Krammer Representation of the Group of Conjugating Automorphisms C_3</th>
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<td>JOURNAL</td>
<td>Journal of the Indian Mathematical Society</td>
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<tr>
<td>YEAR</td>
<td>2022</td>
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<td>PUBLICATION INFO</td>
<td>DOI: 10.48550/arXiv.2109.13501</td>
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<td>THEME / SUBTHEME</td>
<td>Science and Technology/ Mathematical and Computational Science</td>
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<tr>
<td>ABSTRACT</td>
<td>Let Cn be the group of conjugating automorphisms. We study the representation ρ of Cn, an extension of Lawrence-Krammer representation of the braid group Bn, defined by Valerij G. Bardakov. As Bardakov proved that the representation ρ is unfaithful for n≥5, the cases n=3,4 remain open. In our work, we make attempts towards the faithfulness of ρ in the case n=3.</td>
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<th>Author(S)</th>
<th>Numerical Analysis and Simulation for Rayleigh Beam Equation with Dynamical Boundary Controls</th>
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<td>JOURNAL</td>
<td>Arabian Journal of Mathematics</td>
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<tr>
<td>YEAR</td>
<td>2021</td>
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<td>PUBLICATION INFO</td>
<td>DOI: 10.1007/S40065-021-00310-8</td>
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<td>THEME / SUBTHEME</td>
<td>Science and Technology/ Mathematical and Computational Science</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>In this paper, the Rayleigh beam system with two dynamical boundary controls is treated. Theoretically, the well-posedness of the weak solution is obtained. Later, we discretize the system by using the Implicit Euler scheme in time and the P3 Hermite finite element in space. In addition, we show the decay of the discrete energy and we establish some a priori error estimates. Finally, some numerical simulations are presented.</td>
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<th>Author(S)</th>
<th>On the Irreducibility of the Extensions of Burau and Gassner Representations</th>
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<td>JOURNAL</td>
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<td>YEAR</td>
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<td>PUBLICATION INFO</td>
<td>67(18): 415-434</td>
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<td>THEME / SUBTHEME</td>
<td>Science and Technology/ Mathematical and Computational Science</td>
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ABSTRACT

We study the nth degree representations $\rho^{G^n}$ of $C_{bn}$ and $\rho^{B^n}$ of $C_n$, defined by Valerij G. Bardakov, where $C_{bn}$ is the group of basis conjugating automorphisms and $C_n$ is the group of conjugating automorphisms. We prove that $\rho^{G^n}$ is reducible and its $(n-1)$th degree composition factor $\phi^{G^n}$ is irreducible if and only if $t_i \neq 1$ for all $1 \leq i \leq n$. Also we prove that $\rho^{B^n}$ is reducible and its $(n-1)$th degree composition factor $\phi^{B^n}$ is irreducible if and only if $t \neq 1$. Moreover, for $n=3$, we prove that $\phi^{G^n}(t_1,t_2,t_3) \otimes \phi^{G^n}(m_1,m_2,m_3)$ is irreducible if and only if $(t_1,t_2,t_3)$ and $(m_1,m_2,m_3)$ are distinct vectors, and the representation $\phi^{B^n}(t) \otimes \phi^{B^n}(m)$ is irreducible if and only if $t \neq m.$

Author(S)  Kahil R., Abdulrahim M.

ARTICLE TITLE  On the Representations of the Braid Group Constructed by C. M. Egea and E. Galina

JOURNAL  Arabian Journal of Mathematics

YEAR  2021

PUBLICATION INFO  DOI: 10.1007/s40065-021-00352-y

THEME / SUBTHEME  Science and Technology/ Mathematical and Computational Science

ABSTRACT

In this paper, we determine a sufficient condition for the irreducibility of the family of representations of the braid group constructed by C. M. Egea and E. Galina without requiring that the representations are selfadjoint. Then, we construct a new subfamily of multi-parameter representations $(\psi_m, V_m), 1 \leq m < n$, of dimension $V_m = n^m$. Finally, we study the irreducibility of $(\psi_m, V_m).$
The photocatalytic activity of zinc ferrite (ZnFe$_2$O$_4$) nanoparticles (NPs) is suppressed by the rapid recombination of the photogenerated electron-hole pair. Herein, to achieve electron-hole separation, ZnFe$_2$O$_4$ was combined with nickel oxide (NiO) NPs to produce (1-x)ZnFe$_2$O$_4$/xNiO nanocomposites (NCs) with enhanced photocatalytic activity where the weight fraction (x) ranged between 0.1 and 0.5. The photocatalytic performance of ZnFe$_2$O$_4$/NiO NCs was evaluated in the degradation of nitrobenzene under UV irradiation at 254 nm and compared to the activity of pure ZnFe$_2$O$_4$ and NiO NPs. Phase purity tested by X-ray diffraction (XRD) confirmed the sole presence of ZnFe$_2$O$_4$ and NiO. The cubic shape with rounded edges morphology of the prepared samples was revealed in transmission electron microscopy (TEM). The specific surface area of ZnFe$_2$O$_4$/NiO NCs obtained by N2 adsorption-desorption isotherms ranged between 12 and 17 m$^2$/g. The photocatalytic activity of pure NPs and NCs in the degradation of nitrobenzene under UV irradiation was also studied; maximum efficiency was achieved with the (1-x)ZnFe$_2$O$_4$/xNiO NCs where x = 0.3. This was due to the low recombination rate of electron-hole pairs confirmed by photoluminescence (PL) spectroscopy. Several other factors (catalyst dosage, pH and temperature) affecting the degradation efficiency were also investigated. The optimum experimental conditions were applied to identify the products of the degradation reaction. Comparison studies between the photocatalytic activity of ZnFe$_2$O$_4$/NiO NCs and ZnFe$_2$O$_4$/Mn$_2$O$_3$ NCs were reported.

**ABSTRACT**

This study investigates the optical and magnetic properties of nanosized [xNiO/(1−x)CdFe$_2$O$_4$] composites. The samples were synthesized using the wet coprecipitation technique. The X-ray Diffraction patterns demonstrated the formation of Nickel Oxide (NiO) and Cadmium Ferrite (CdFe$_2$O$_4$) phases without any chemical reaction between them. Fourier Transform Infrared results confirm the formation of pure NiO, pure CdFe$_2$O$_4$, and nanosized NiO/CdFe$_2$O$_4$ composites. Transmission Electron Microscopy micrographs show agglomeration between the nanoparticle domains, demonstrating the magnetic interaction between the oxide and ferrite phases. High-Resolution Transmission Electron Microscopy results verify the presence of NiO and CdFe$_2$O$_4$ phases in each nanosized composite without impurities, which is consistent with the XRD data. The ultraviolet-visible spectroscopy results confirm that HCl is a better solvent than ethanol in investigating the optical properties of nanosized oxide/ferrite composites. Photoluminescence spectra exhibited asymmetricity owing to the presence of various emission peaks, which reveals the distribution of defect states within the bandgap of the nanosized composites. The Mössbauer spectra of the nanosized composites comprised an asymmetrical doublet at 300 K and an asymmetrical centered doublet within minor sextets at 77 K. Vibrating Sample Magnetometer study showed a shift at 77 K, which can be attributed to the spontaneous exchange bias effect. The magnetic parameters extracted from the M−H loops of all the synthesized nanosized composites at 77 K are higher than those at 300 K.
**ARTICLE TITLE**
Phytochemical Constituents and Therapeutic Effects of the Essential Oil of Rose Geranium (Pelargonium Hybrid) Cultivated in Lebanon

**JOURNAL**
South African Journal of Botany

**YEAR**
2022

**PUBLICATION INFO**
147: 894-902

**THEME / SUBTHEME**
Health and Wellbeing/ Human Disorders at the Molecular Level

**ABSTRACT**
The current study provides the first comprehensive assessment of rose geranium oil (commercially referred to as a hybrid of Pelargonium graveolens L’Hér.) extracted from plants cultivated in Lebanon. The chemical composition was deciphered by GC–MS, and citronellol (30.5%), citronellyl formate (15.9%), trans-geraniol (12.8%), linalool (8.6%), and isomenthone (8.0%) were the major constituents. The oil composition most closely resembles rose geranium oil from Egypt. The essential oil exhibited weak antioxidant activity with only 16% inhibition achieved at 2.2 mg/mL in the DPPH radical-scavenging assay. The antiinflammatory activity of the essential oil was evaluated in three different setups, namely albumin denaturation, heat induced hemolysis, and nitric oxide scavenging activity, where a dose-dependent response was observed in the different assays. Assessment of the antibacterial activity of the essential oil revealed a bactericidal effect against the tested bacterial strains. The essential oil showed good cytotoxicity against HCT 116 human colon cancer cells with an IC50 value of 74 µg/mL as determined by the MTT cell viability assay. In the acetylcholinesterase (AChE) inhibition assay, the oil displayed a dose-dependent inhibition of AChE enzyme with an IC50 value of 10.5 mg/mL, thus highlighting the anti-Alzheimer’s protection potential of the extract. Finally, no significant hemolytic activity was observed even at the highest tested concentration (5 mg/mL). In conclusion, rose geranium oil produced in Lebanon demonstrated promising biological properties, and its cultivation for medicinal and industrial applications is highly recommended.

**ARTICLE TITLE**
Preparation and Characterisation of Transition Metal Ions (Fe3+, Mn2+) Doped CdO Nanoparticles

**JOURNAL**
International Journal of Nanoparticles

**YEAR**
2022

**PUBLICATION INFO**
14(1): 31-46

**THEME / SUBTHEME**
Science and Technology/ Advanced Materials

**ABSTRACT**
Pure, Fe3+, and Mn2+ doped CdO nanoparticles were prepared by the wet co-precipitation technique. The crystal structure, vibrational modes, and morphology of the CdO nanoparticles were studied using X-ray powder diffraction (XRD), Fourier transmission infrared spectroscopy (FTIR), and transmission electron microscopy (TEM), respectively. XRD and TEM studies showed a reduction in the lattice parameters and particle size relative to the pure sample, respectively. The Cd-O vibration bands were detected by the FTIR analysis. The photoluminescence spectra showed deep-level blue and violet emissions attributed to Cd vacancies. The energy band-gap obtained from UV-visible spectroscopy (UV-Vis) was enhanced with the transition metal (T-M) ions substitutions. The M-H measurements showed a transition from diamagnetic to ferromagnetic behaviours as an effect of T-M substitution. Accordingly, this study reveals that the magneto-optical properties of CdO nanoparticles can be tuned by substitution with different transition metal ions, allowing for different applications such as magnetically recyclable photocatalysts and spin-valve devices.
**Protective Effect of Sorafenib Against 1,2-Dimethylhydrazine-Induced Colorectal Cancer in Balb/c Mice**

*Onkologia i Radioterapia* 2021 15(8): 18-24

**Health and Wellbeing / Human Disorders at the Molecular Level**

Colorectal Cancer (CRC) is the third leading cause of cancer death in the world whose incidence is progressively rising in developing nations. It is treated with both chemotherapeutic and immunotherapeutic agents. Sorafenib is a broad-spectrum multikinase inhibitor proven to be effective in treating different types of carcinoma, including liver, thyroid, renal, and breast cancers. This study aimed to investigate the effect of Sorafenib against 1,2-dimethylhydrazine (DMH)-induced CRC in mice. Mice were injected with DMH (20 mg/kg) over 12 weeks to induce the cancer. Mice were treated with Sorafenib (30 mg/Kg for 5 days). Colon tissues were examined by histological analysis, and gene expression level of key players involved in the Wnt signaling pathway were assessed using RT-PCR. Our results showed that Sorafenib restored the normal histology and structure of colonic tissue. Sorafenib downregulated the expression level of Wnt5a and Cyclin D1 and upregulated that of APC, GSK-3β and β-catenin compared to untreated control. In conclusion, Sorafenib inhibits DMH-induced CRC by targeting the Wnt signaling pathway.

**Pure and Lanthanum-Doped Zinc Oxide Nanoparticles: Synthesis, Characterization, and Antibacterial Activity**

*Applied Physics A: Materials Science and Processing* 2022

**DOI: 10.1007/s00339-022-05942-x**

**Science and Technology / Advanced Materials**

Pure and lanthanum-doped zinc oxide nanoparticles (Zn1-xLaxO), with atomic percentages (x=x= 0, 1, 3, 5 and 7 at%) were prepared by chemical co-precipitation method. The synthesized samples have been characterized using X-ray diffraction (XRD), transmission electron microscopy (TEM), Fourier transform infrared spectroscopy (FTIR), UV–visible spectroscopy, photoluminescence spectroscopy (PL) and M-H loop using vibrating sample magnetometer (VSM). XRD analysis reveals the wurtzite hexagonal crystal structure of ZnO structure with the detection of lanthanum oxide secondary phase (La2O3) for x≥3 at%. The increase of the lanthanum content affects the particles size, energy bandgap and lattice parameters. The presence of functional groups and the chemical bonding is confirmed by FTIR spectra that shows the formation of additional peaks due to ZnO ions dopant. The direct energy bandgap was calculated, showing a noticeable change as the concentration of the lanthanum content increases. The photoluminescence spectra show 8 emission peaks due to different defects. The M-H curves exhibited a combination of both diamagnetic and ferromagnetic contributions. The antibacterial activity of the synthesized samples was studied against three gram-negative (*Escherichia coli, Klebsiella pneumoniae*, and *Citrobacter braakii*) and three gram-positive (*Staphylococcus aureus, Staphylococcus haemolyticus*, and *Streptococcus intermedius*) bacterial strains using agar well diffusion method. These nanoparticles exhibited various degrees of antibacterial activity against the investigated bacteria.
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<tr>
<th>Author(S)</th>
<th>Najib R., Houri T., Khairallah Y., Khalil M.</th>
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<tr>
<td>ARTICLE TITLE</td>
<td>Quercus cerris L.: An Overview</td>
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<td>JOURNAL</td>
<td>Forestry Studies</td>
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<td>YEAR</td>
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<td>PUBLICATION INFO</td>
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<td>THEME / SUBTHEME</td>
<td>Science and Technology/ Environmental Studies</td>
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<td>ABSTRACT</td>
<td>The Turkey oak is a frequent tree species in the Mediterranean climate zones of southern Europe and Asia Minor. It has been used in the human diet, for medicinal purposes, firewood and charcoal production. Like all oaks, Turkey oak is suffering from dieback and decline owing to the combination of several detrimental factors, such as insects, diseases and unfavorable environment, leading to their deterioration and sometimes resulting in their early death.</td>
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<th>Author(S)</th>
<th>Salem M., Shaheen M., Tabbara A., Borjac J.</th>
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<tr>
<td>ARTICLE TITLE</td>
<td>Saffron Extract and Crocin Exert Anti-inflammatory and Anti-oxidative Effects in a Repetitive Mild Traumatic Brain Injury Mouse Model</td>
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<td>JOURNAL</td>
<td>Scientific Reports</td>
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<td>YEAR</td>
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<td>PUBLICATION INFO</td>
<td>DOI: 10.1038/s41598-022-09109-9</td>
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<td>THEME / SUBTHEME</td>
<td>Health and Wellbeing/ Human Disorders at the Molecular Level</td>
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<tr>
<td>ABSTRACT</td>
<td>Saffron (50 mg/kg) and crocin (30 mg/kg) were administrated intraperitoneally 30 min before mTBI induction. Behavioral tests were conducted to assess behavioral deficits including the modified neurological severity score (mNSS), Morris water maze (MWM), pole climb test, rotorod test, and adhesive test. The levels of TNF alpha (TNF-α), interferon-gamma (IFN-γ), myeloperoxidase activity (MPO), malonaldehyde (MDA), and reduced glutathione (GSH) were measured. Histological analysis of different brain parts was performed. Both saffron and crocin demonstrated marked improved neurological, cognitive, motor, and sensorimotor functions. Besides, both compounds significantly reduced the oxidative stress and inflammatory processes. No abnormal histological features were observed in any of the injured groups. Saffron extract and crocin provide a neuroprotective effect in a mouse model of rmTBI by decreasing oxidative stress, inflammatory responses, and behavioral deficits.</td>
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<th>Author(S)</th>
<th>Shaheen M., Bekdash A., Itani H., Borjac J.</th>
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<td>ARTICLE TITLE</td>
<td>Saffron Extract Attenuates Neuroinflammation in rmTBI Mouse Model by Suppressing NLRP3 Inflammasome Activation via SIRT1</td>
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<td>JOURNAL</td>
<td>PLoS ONE</td>
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<td>YEAR</td>
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<td>16(9): 1-20</td>
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<td>THEME / SUBTHEME</td>
<td>Health and Wellbeing/ Human Disorders at the Molecular Level</td>
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<td>ABSTRACT</td>
<td>Traumatic brain injury (TBI) remains a major cause of morbidity and disability worldwide and a healthcare burden. TBI is an important risk factor for neurodegenerative diseases hallmarkd by exacerbated neuroinflammation. Neuroinflammation in the cerebral cortex plays a critical role in secondary injury progression following TBI. The NOD-like receptors (NLR) family pyrin domain containing 3 (NLRP3) inflammasome is a key player in initiating the inflammatory response in various central nervous system disorders entailing TBI. This current study aims to investigate the role of NLRP3 in repetitive mild traumatic brain injury (rmTBI) and identify the potential neuroprotective effect of saffron extract in regulating the NLRP3 inflammasome. 24 hours following the final injury, rmTBI causes an upregulation in mRNA levels of NLRP3, caspase-1, the apoptosis-associated speck-like protein containing a CARD (ASC), nuclear factor kappa B (NF-κB), interleukin-1β (IL-1β), interleukin 18 (IL-18), nuclear factor erythroid 2–related factor 2 (NRF2) and heme oxygenase 1 (HMOX1). Protein levels of NLRP3, sirtuin 1 (SIRT1), glial fibrillary acidic protein (GFAP), ionized calcium-binding adaptor molecule 1 (Iba1), and neuronal nuclei (Neu N) also increased after rmTBI. Administration of saffron alleviated the degree of TBI, as evidenced by reducing the neuronal damage, astrocite, and microglial activation. Pretreatment with saffron inhibited the activation of NLRP3, caspase-1, and ASC concurrent to reduced production of the inflammatory cytokines IL-1β and IL-18. Additionally, saffron extract enhanced SIRT1 expression, NRF2, and HMOX1 upregulation.</td>
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ARTICLE TITLE
Stabilized Gauge Uzawa Scheme for an Incompressible Micropolar Fluid Flow

JOURNAL
Applied Numerical Mathematics

YEAR
2021

ABSTRACT
In this paper, a second order Gauge Uzawa scheme for the governing equations of an incompressible micropolar fluid flow is introduced and analyzed. The derivation of this scheme is obtained using the second order backward difference approximation. Later, the unconditional stability of the GUM scheme for the micropolar equations will be shown. Then, an a priori error estimate is established to prove the convergence. Finally, we present some numerical simulations that confirm the theoretical results.

Author(S)
Slayi S., El Arwadi T., Dib S.
In this work, magnetic nanocomposites $\text{Ba}_{0.5}\text{Sr}_{0.5}\text{Fe}_{12}\text{O}_{19}/x(\text{Ni}_{0.5}\text{Zn}_{0.5})\text{Fe}_2\text{O}_4$ with the compositions $x = 10, 20, 30, \text{and} 50 \text{wt}\%$, arising from nickel-zinc ferrite added to barium strontium hexaferrite were prepared and characterized. The samples were synthesized using co-precipitation and ball milling methods. X-ray powder diffraction measurements validated the synthesis of nanocomposite with high purity and crystallinity. A transmission electron microscope was also used to analyze the morphology of the nanocomposites that demonstrated hexagonal platelet-like and spherical-like shapes for hard and soft phases, respectively. Also, multiple shapes of different grain sizes were formed, and their grain size decreased upon the addition of the soft phase. Besides, the elemental compositions and the oxidation states of (Ba$^{2+}$, Sr$^{2+}$, Ni$^{2+}$, Ni$^{3+}$, Zn$^{2+}$, Fe$^{2+}$, Fe$^{3+}$ and O$^{2-}$) constituting the nanocomposites were investigated, using X-ray photoelectron spectroscopy. Additionally, the magnetic properties were examined using a vibrating sample magnetometer. According to Henkel plots, the existence of a weak exchange coupling interaction and the dominance of dipolar interactions were visible upon the addition of Ni$_{0.5}$Zn$_{0.5}$Fe$_2$O$_4$. Furthermore, the maximum energy product, $(BH)_{\text{max}}$, is the energy density that a hard ferrite can store with low magnetic anisotropy. $(BH)_{\text{max}}$ of the nanocomposite containing 10 wt% of soft phase increased by 10% when compared to pure hard phase, reaching the highest value of $(BH)_{\text{max}}$ equal to 22.89 kJ/m$^3$. 

Recently, there have been several significant improvements in the area of the radiation detection system and its instruments, especially those using scintillation or semiconductor gamma ray detectors. Scientists and technicians are interested in studying this progress, which can be useful for the detector’s operation and its basic properties, such as energy, shape, and efficiency calibration. In this work, an extended study of various mathematical formulas was conducted to obtain the efficiency best-fitting function, that covers the measured values from low to high energy regions. They can be used to represent the efficiency of a high-purity germanium detector in the regions where accuracy and maximum speed in optimizing the calibration process are very important for gamma spectroscopy. Determination of the activity of environmental samples mainly depends on the efficiency calibration curve of the detection system. The gamma ray energy in the range from 59.54 up to 1408.01 keV used in this work was obtained by using a set of standard radioactive gamma ray sources of certified intensity. The current data analysis shows that most of the mathematical formulas, which represent the fitting curve for the detector full-energy peak efficiency, were quite agreeable with the experimental results.
**ARTICLE TITLE**

Synthesis and Magneto-optical Studies of Novel Ni$_0.5$Zn$_0.5$Fe$_2$O$_4$/Zn$_0.95$Co$_{0.05}$O Nanocomposite as a Candidate for Photocatalytic Applications

**JOURNAL**

Ceramics International

**YEAR**

2022

**PUBLICATION INFO**

48[1]: 1238-1255

**THEME / SUBTHEME**

Science and Technology/ Advanced Materials

**ABSTRACT**

The preparation and characterization of novel nanocomposites (NCs) (1-x)Ni$_0.5$Zn$_0.5$Fe$_2$O$_4$/xZn$_0.95$Co$_{0.05}$O, where x = 0.1, 0.2, 0.3, 0.4 and 0.5, is presented in the current investigation. The synthesis of NCs with high purity and crystallinity was confirmed by X-ray powder diffraction (XRD) measurements. Furthermore, the morphology of the NCs was examined using a transmission electron microscope (TEM) and high-resolution transmission electron microscope (HRTEM) analysis. The synthesis of well-dispersed spherical nanoparticles with a size range of 27–34 nm was confirmed. The investigation of the optical properties, by using UV–vis and photoluminescence (PL) spectroscopies, has shown a dependence of the energy bandgap and the PL intensity on the amount of Zn$_0.95$Co$_{0.05}$O. Additionally, X-ray photoelectron spectroscopy (XPS) was used to investigate the elemental composition and oxidation states of the elements forming the nanocomposites. Furthermore, M – H loop studies have shown that all NCs possess a soft ferromagnetic behavior with a single magnetic phase. The saturation magnetization was found to decrease with x. Several magnetic parameters including the retentivity, coercivity, magneton number, and anisotropy field are determined and discussed in correlation with the structural and optical properties. This magneto-optical investigation suggests the utilization of (1-x)Ni$_0.5$Zn$_0.5$Fe$_2$O$_4$/xZn$_0.95$Co$_{0.05}$O NCs as a possible candidate for photocatalytic applications.

**ARTICLE TITLE**

Tailoring the Physical Properties of (Bi, Pb)-2212 Superconductor by the Addition of Cd$_{0.95}$Mn$_{0.05}$O Nanoparticles

**JOURNAL**

Journal of Low Temperature Physics

**YEAR**

2022

**PUBLICATION INFO**

208: 271-288

**THEME / SUBTHEME**

Science and Technology/ Advanced Materials

**ABSTRACT**

The effect of CdMnO addition on the physical properties of Bi-2212 superconductors was investigated. The conventional solid-state reaction technique was employed for the synthesis of Cd$_{0.95}$Mn$_{0.05}$O$_x$Bi$_{1.6}$Pb$_{0.4}$Sr$_{1.9}$Ca$_{1.1}$Cu$_{2.1}$O$_8$+$\delta$ samples with $0.00 \leq x \leq 0.10$ wt.%. The X-ray diffraction confirms the formation of the orthorhombic phase of Bi-2212 superconductors. The lattice parameter a shows an increase with x, conversely the lattice parameters b and c show a decrease. The scanning electron microscope (SEM) images have shown an enhancement in the grain connectivity and a reduction of voids due to the CdMnO addition. The Fourier transform infrared (FTIR) spectroscopy analysis shows a remarkable shift in the wave number positions due to the addition of CdMnO nanoparticles. The superconducting transition temperature ($T_c$) and the critical current density ($J_c$) show an enhancement with CdMnO addition up to x = 0.05 wt.%. The elemental composition and oxidation state of all elements were determined from the X-ray photoelectron emission (XPS) analysis. The work suggests a correlation between the variations of the superconducting properties and the dynamics of the cationic equilibrium reactions among Pb$^{2+}$ ions in Bi$^{3+}$ or Cu$^{2+}$ sites. These equilibrium reactions are induced by the variations in the oxygen content produced by the addition of CdMnO nanoparticles.
Targeting Colorectal Cancer Cells with a Functionalised Calix[4]arene Receptor: Biophysical Studies

**ARTICLE TITLE**
Targeting Colorectal Cancer Cells with a Functionalised Calix[4]arene Receptor: Biophysical Studies

**JOURNAL**
Molecules

**YEAR**
2022

**PUBLICATION INFO**
DOI: 10.3390/molecules27020510

**THEME / SUBTHEME**
Science and Technology/ Advanced Materials

**ABSTRACT**
Colorectal cancer (CRC) is a disease which is causing a high degree of mortality around the world. The present study reports the antiproliferative impact of the thioacetamide calix[4]arene, CAII receptor on a highly differentiated Caco-2 cell line. This statement is corroborated by the MTT assay results which revealed a reduction in the cell viability with an IC50 value of 19.02 ± 0.04 µM. Microscopic results indicated that at the starting amount of 10 µM of CAII, a decrease in cells confluency can already be observed in addition to changes in cells morphology. Cell metabolic pathway changes were also investigated. 1H NMR findings showed downregulation in lactate, pyruvate, phosphocholine, lipids, and hydroxybutyrate with the upregulation of succinate, indicating a decline in the cells proliferation. Some biochemical alterations in the cells as a result of the CAII treatment were found by Raman spectroscopy.

The Effect of Ruthenium Substitution on the Optical and Magnetic Properties of Zinc Ferrite Nanoparticles

**ARTICLE TITLE**
The Effect of Ruthenium Substitution on the Optical and Magnetic Properties of Zinc Ferrite Nanoparticles

**JOURNAL**
Journal of Materials Science: Materials in Electronics

**YEAR**
2022

**PUBLICATION INFO**
DOI: 10.1007/s10854-022-08355-x

**THEME / SUBTHEME**
Science and Technology/ Advanced Materials

**ABSTRACT**
The preparation and characterization of ZnRu$_x$Fe$_{2-x}$O$_4$ nanoparticles are reported in the current investigation. The successful synthesis of monocrystalline ZnRu$_x$Fe$_{2-x}$O$_4$ by wet coprecipitation method, with high purity and crystallinity in the nanoscale was confirmed via x-ray powder diffraction and transmission electron microscopy. The crystallite size of ZnRu$_x$Fe$_{2-x}$O$_4$ nanoparticles has decreased due to microstrain induced by Ru$^{3+}$ substitution. EDX investigations have assured the elemental compositions of all prepared samples. The optical studies, conducted via UV–vis spectroscopy analysis, have shown an increase in both direct and indirect bandgap energies, in relation to the quantum size confinement effect. Additionally, PL studies have revealed UV and deep level emissions for all samples. The analysis of the PL spectra suggested an increase in the photocatalytic activity of Ru$^{3+}$ substituted ZnFe$_2$O$_4$ nanoparticles. Finally, VSM studies have shown unsaturated M-H loops for all samples with a soft ferromagnetic signature at lower fields. The analysis of the magnetic parameters suggests the use of ZnRu$_x$Fe$_{2-x}$O$_4$ as magnetically recyclable photocatalysts.

The Effect of Salvia fruticosa Water Extract in Acetic-Acid-Induced Colitis in Mice

**ARTICLE TITLE**
The Effect of Salvia fruticosa Water Extract in Acetic-Acid-Induced Colitis in Mice

**JOURNAL**
BAU Journal-Science and Technology

**YEAR**
2022

**PUBLICATION INFO**
3(2): 1-15

**THEME / SUBTHEME**
Health and Wellbeing/ Human Disorders at the Molecular Level

**ABSTRACT**
Inflammatory bowel disease (IBD) including Ulcerative colitis (UC) and Crohn’s disease, is a chronic condition of the intestine characterized by an uncontrolled inflammatory response. Current biologic treatments developed to treat IBD are expensive and associated with significant side effects; thus, alternative approaches are required. Recently, herbal concoctions have emerged as promising intervention. This study investigates the protective effects of Salvia fruticosa (SF) against acetic acid-induced colitis in mice, a model of human inflammatory bowel disease (IBD). Mice were divided into four groups (n=3). IBD was induced with acetic acid (6%). SF was administered by gavage at 1.5ug/kg mimicking folk medicine. SF treatment was given for 2, 4 & 6 days. After treatment, colons were collected for colonic biochemical markers, and histopathological evaluation. SF treatment induced enhancement in the colon’s structure and decreased ulcerations and inflammation. It significantly decreased pro-inflammatory cytokines TNF-α by 2.1-fold and 0.9-fold respectively at day2 and 6 and IL-6 by 2.8-fold at day 2 & 1.7-fold at day 6. Also, pro-inflammatory cytokine INF-γ showed a significant 22-fold decrease at day2 in SF-treated colitic group. Moreover, Myeloperoxidase (MPO) and Malondialdehyde (MDA) levels decreased showing the anti-oxidant property of the extract.
Towards an Early Diagnosis of Alzheimer Disease: A Precise and Parallel Image Segmentation Approach via Derived Hybrid Cross Entropy Thresholding Method

**ARTICLE TITLE**

Towards an Early Diagnosis of Alzheimer Disease: A Precise and Parallel Image Segmentation Approach via Derived Hybrid Cross Entropy Thresholding Method

**JOURNAL**

Multimedia Tools and Applications

**YEAR**

2022

**PUBLICATION INFO**

81: 12619-12642

**THEME / SUBTHEME**

Science and Technology/ Mathematical and Computational Science

**ABSTRACT**

Alzheimer’s disease (AD) is an irreversible and progressive brain disease causing brain degenerative disorder and dementia. An early diagnosis of AD provides the individual an opportunity to participate in clinical trials. Computer Aided Diagnosis (CAD) system in the health care sector has been widely used and plays an important role in detecting such diseases. However, the main challenge of such systems is through identifying the region of interest obtained through precise segmentation. This paper attempts to solve the segmentation issue by developing a precise image segmentation model. The proposed model used a derivation of a hybrid cross entropy thresholding technique for the precise extraction of infected regions. In other words, a novel segmentation methodology has been proposed using the output derivation of both Gamma and Gaussian distributions. Moreover, to tackle the performance and time-consuming problems in digital image segmentation, a parallel boosting methodology has been developed and implemented. Through using the ADNI, OASIS, and MIRIAD benchmark datasets, the experimentation results validate the effectiveness of the proposed model through achieving more than 90% accuracy with 2x times speed improvement compared to other benchmark segmentation methods.

Author(S)

Rawas S., El-Zaart A.

**ARTICLE TITLE**

Toxoplasmosis: Current and Emerging Parasite Druggable Targets

**JOURNAL**

Microorganisms

**YEAR**

2021

**PUBLICATION INFO**

DOI: 10.3390/microorganisms9122531

**THEME / SUBTHEME**

Health and Wellbeing/ Industrial and Medical Microbiology

**ABSTRACT**

Toxoplasmosis is a prevalent disease affecting a wide range of hosts including approximately one-third of the human population. It is caused by the sporozoan parasite Toxoplasma gondii (T. gondii), which instigates a range of symptoms, manifesting as acute and chronic forms and varying from ocular to deleterious congenital or neuro-toxoplasmosis. Toxoplasmosis may cause serious health problems in fetuses, newborns, and immunocompromised patients. Recently, associations between toxoplasmosis and various neuropathies and different types of cancer were documented. In the veterinary sector, toxoplasmosis results in recurring abortions, leading to significant economic losses. Treatment of toxoplasmosis remains intricate and encompasses general antiparasitic and antibacterial drugs. The efficacy of these drugs is hindered by intolerance, side effects, and emergence of parasite resistance. Furthermore, all currently used drugs in the clinic target acute toxoplasmosis, with no or little effect on the chronic form. In this review, we will provide a comprehensive overview on the currently used and emergent drugs and their respective parasitic targets to combat toxoplasmosis. We will also abridge the repurposing of certain drugs, their targets, and highlight future druggable targets to enhance the therapeutic efficacy against toxoplasmosis, hence lessening its burden and potentially alleviating the complications of its associated diseases.

Author(S)


**ARTICLE TITLE**

Anti-oxidant Glutathione (GSH) level and anti-inflammatory cytokine IL-10, remained at normal levels while an increase by 0.9-fold at day 2 and 0.5-fold at day 6 in anti-inflammatory cytokine TGF-β in healthy SF-treated groups was significant. Hence, Salvia fruticosa exerts an anti-inflammatory and anti-oxidant effects against IBD as well as it help healing colon ulcers and maintain its architecture.
**ARTICLE TITLE**
Tuning the Structural, Optical and Magnetic Properties of PVP-Capped NiO Nanoparticles by Gadolinium Doping

**JOURNAL**
Applied Physics A: Materials Science and Processing

**YEAR**
2021

**PUBLICATION INFO**
DOI: 10.1007/s00339-021-04838-6

**THEME / SUBTHEME**
Science and Technology/ Advanced Materials

**ABSTRACT**
Pure and Gd-doped NiO nanoparticles capped by polyvinylpyrrolidone (PVP) were synthesized via the co-precipitation method, with different concentrations \(x=0.000, 0.005\) and \(0.010\). Extensive experimental assessments were conducted to study the structural, optical and magnetic properties of the prepared nanoparticles. The X-ray diffraction patterns depicted the formation of pure NiO phase without impurities, assuring the adequate incorporation of Gd dopants into the lattice. The transmission electron micrographs showed the pseudospherical morphology of the pure and Gd-doped samples, with mean sizes, ranging between 28.99 and 22.84 nm. The vibrational spectroscopies confirmed the purity of the synthesized samples and gave insight into their structural properties. Moreover, the excitation dependence of the photoluminescence emission spectra was noticed due to the particles’ size distribution. Some point defects, as the nickel and oxygen vacancies, were tuned upon the introduction of Gd dopants, leading to enhancements in the optical and magnetic properties. The optimum concentration of Gd dopants was \(x=0.005\) in Ni\(_{1-x}\)Gd\(_x\)O nanoparticles since it attained the widened bandgap energy of 3.46 eV and highest saturation magnetization of 0.23 emu/g at an applied field of 20 kG. All the samples demonstrated weak ferromagnetic nature, which was deduced from the M-H loops after subtracting the linear magnetization of the antiferromagnetic contribution. The Belov–Arrot plot showed a second-order magnetic transition from antiferromagnetic to ferromagnetic nature. The improvements in PVP-capped Gd-doped NiO nanoparticles are fruitful for light-emitting devices and spintronic applications.

**ARTICLE TITLE**
Vanadium-Substituted Polyoxomolybdates for Methylene Blue Adsorption from Aqueous Solutions

**JOURNAL**
Journal of Cluster Science

**YEAR**
2022

**PUBLICATION INFO**
33(1): 2077-2083

**THEME / SUBTHEME**
Science and Technology/ Advanced Materials

**ABSTRACT**
The objective of this study is to assess the effectiveness of three vanadium-substituted polyoxomolybdates, [PMo\(_{11}\)VO\(_40\)]\(^{-}\), [PMo\(_{10}\)V\(_2\)O\(_40\)]\(^{5-}\), and [PMo\(_9\)V\(_3\)O\(_40\)]\(^{6-}\), for the removal of methylene blue dye (MB) from aqueous solutions. The materials were synthesized and initially characterized by Fourier transform infrared spectroscopy (FTIR) to confirm purity. Then the effect of several experimental factors, such as contact time (0–55 min), adsorbent dose (0.003–0.2 g), initial dye concentration (2–35 mg/L), as well as pH (1–10) and temperature (293–313 K) of the reaction, were investigated in order to identify the optimum conditions for each parameter. Accordingly, MB concentrations were recorded before and after adsorption using an ultraviolet–visible spectrophotometer (UV–Vis) at 664 nm. Hence, the synthesized compounds, which are all negatively charged, showed high removal efficiency towards the cationic dye. Optimized results for 25 mg/L methylene blue exhibited a contact time of only 10 min for [PMo\(_{11}\)VO\(_40\)]\(^{-}\) and [PMo\(_{10}\)V\(_2\)O\(_40\)]\(^{5-}\), while only 5 min for [PMo\(_9\)V\(_3\)O\(_40\)]\(^{6-}\). For [PMo\(_9\)V\(_3\)O\(_40\)]\(^{6-}\), the percentage of removal decreases from 92.70 to 78.20% with increasing pH showing the suitability of acid pH.
Faculty of
PHARMACY

Research Report 2021 - 2022
# I. PUBLICATIONS
## ARTICLES

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<th>ARTICLE TITLE</th>
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**ABSTRACT**

**Objective**

Little research addressed training pharmacy students on bias towards vulnerable patients such as migrant domestic workers (MDWs). This study evaluates a module addressing bias and cultural competence when working with MDWs in community pharmacies.

**Methods**

Two cohorts of Lebanese Bachelor of pharmacy students completed this module as part of a core Public Health class. Guided by a social psychology framework, the module involved watching a lecture, discussing an article, watching a video addressing bias in healthcare, and taking an Implicit Association Test. Second, students interviewed one MDW and one pharmacist before filling a reflection worksheet. Students’ reflections were analyzed qualitatively using content analysis. Further, to evaluate the module’s impact quantitatively, an aggregate perception of helpfulness scale was created and validated. Items addressed students’ own experience with the module as well as its impact on pharmacists interviewed by students.

**Results**

Of 170 students completing the module and providing qualitative data, 131 were asked to fill a survey addressing perceptions of assignment helpfulness. Of those 131 students, 126 filled the survey. On a scale ranging from zero to four, the composite mean score for helpfulness was 3.4, SD = 0.5. Students reported a positive impact of the interview in improving awareness of bias for pharmacists they interviewed (mean = 3.5, SD = 0.6). Qualitative analysis produced insight into students’ experience with the module, including challenges in communication with MDWs; MDWs’ experience with bias and its repercussions; predictability, or lack thereof, of assignment results; plans to address bias after taking the module; evaluation of interviewed pharmacists’ service; and perceived pharmacists’ impressions of the assignment.

**Conclusions**

A two-part module shows promise in educating pharmacy students about bias and cultural competence. Engaging target audience including pharmacists can make such experiences meaningful for students while providing a learning opportunity for those health professionals.

* Names in Bold Indicate BAU Authors
# A National Study on the Resilience of Community Pharmacists in Lebanon: A Cross-Sectional Survey

**Author(s)**: Alameddine M., Bou-Karroum K., Hijazi M.

**Abstract**

**Background**
Community pharmacists are among the most accessible healthcare professionals and are likely to experience the full brunt of public health crises. In Lebanon, the COVID-19 pandemic, added to a severe economic meltdown, have significantly disrupted an already suffering profession.

**Methods**
The objective of this study was to determine the level of resilience and its relationship to burnout, job satisfaction, intention to quit, and changes in practice. The study utilized a cross-sectional design to survey community pharmacists using an online questionnaire that included the Connor-Davidson Resilience Scale and the Copenhagen Burnout Inventory. All community pharmacists were invited to participate. Multiple logistic regression identified variables significantly associated with the resilience of pharmacists.

**Results**
A total of 459 community pharmacists completed the questionnaire. Respondents had a relatively low resilience level (68.0 ± 13.37). They also had higher scores on the client-related burnout (58.06 ± 17.46), followed by the personal burnout (56.51 ± 16.68) and the work-related burnout (55.75 ± 13.82). In this sample, 52.3% of pharmacists indicated that they are dissatisfied with their job and 41.1% indicated an intention to quit in the coming year. According to multivariate analysis, marital status (ß = 0.38; 95% CI 0.16-0.91; p = 0.03), intention to quit (ß = 0.384; 95% CI 0.149-0.987; p = 0.047), workload (ß = 0.275; 95% CI 0.096-0.783; p = 0.014), perception of safety (ß = 0.267; 95% CI 0.078-0.909; p = 0.035), and personal burnout (ß = 0.321; 95% CI 0.152-0.677; p = 0.003) were independent influencing factors for resilience.

**Conclusions**
Multiple challenges and crises have culminated to the low job satisfaction, high burnout, and high the intention to quit of community pharmacists. This seriously destabilized the labor market of pharmacists which could negatively affect public safety. Effective interventions are essential to enhance the well-being and job satisfaction of pharmacists during public health crisis.

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# A Nationwide Assessment of Community Pharmacists’ Attitudes Towards Dispensing Errors: A Cross-Sectional Study

**Author(s)**: Karout S., Khojah H., Karout L., Itani R.

**Abstract**

**Objectives**
Dispensing errors (DEs) are common causes of preventable harm to patients. Interestingly, very little is known about their prevalence and types in the community pharmacy setting in Lebanon due to the lack of an effective reporting system. Therefore, this study aims to explore the perceptions of community pharmacists about the types of these errors in Lebanon, the factors behind their occurrence, the reasons for under-reporting, and the current practices for reducing them.

**Methods**
A cross-sectional survey was conducted through a self-administered questionnaire, using a scale of 0-4, distributed among a sample of community pharmacists in Lebanon.

**Results**
A total of 171 pharmacists responded to the survey, of whom 68% reported that DEs were common, and 52% believed that they were increasing. The main reported contributing factors to DEs were unreadable and incomplete prescriptions (~3.0 ± 1.0 out of 5), workload, multitasking, interruptions, similarity in names of medications, and fatigue (~2.5 ± 1.0). Moreover, the perceived strategies to limit the risks of DEs were collaboration with physicians, improving handwriting, double-checking, proper patient counseling, encouraging reporting, and issuance of guidelines (~3.2 ± 1.0). Finally, the main reasons for underreporting DEs were the lack of obligation to report and the lack of reporting systems (59% and 56%, respectively).

**Conclusions**
DEs may be very prevalent in Lebanon because they are unmonitored by the authorities. Electronic prescription and fair reporting systems are highly recommended, along with follow-up studies.
### Background
In the wake of COVID-19, community pharmacists (CP) were called upon to free up healthcare providers to treat more serious conditions and alleviate overcrowded healthcare centers. CPs were placed under tremendous pressure, where many patients primarily sought their health advice. This situation raised concerns about the preparedness of CPs in facing these challenges. Therefore, this study aimed to assess the appropriateness of pharmaceutical care provided by CPs to patients with suspected COVID-19 and to investigate their communication skills.

### Methods
A simulated patient (SP) study was conducted among randomly selected community pharmacies in Beirut, Lebanon. Each pharmacy was visited by the SP who complained of fever and loss of smell sensation. Interactions between the attending pharmacist and the suspected COVID-19 patient were documented directly after each visit in a standardized data collection form.

### Results
More than half of the CPs (56%) did not retrieve any relevant information to assess the patient’s condition. While pharmacists’ responses were limited to one to two recommendations, with the majority recommending the patient to perform the PCR test (90%), inappropriate recommendations made by the CPs included mainly the confirmation that the patient had COVID-19 without prior testing (9%), and prescribing either an antimicrobial drug (5%) or dietary supplements (20%), claiming that the latter are essential to boost the patient’s immunity. As for the pharmacist-patient communication skills, the mean total score was 2.25 ± 0.79 (out of 4), displaying nonoptimal and ineffective communication.

### Conclusion
An unsatisfactory and suboptimal provision of pharmaceutical care to a suspected COVID-19 case was evident. This may be a public health threat, particularly for developing countries that lack an efficient and unified healthcare system. The findings should alert health authorities to support and guide community pharmacists in assisting suspected COVID-19 patients.
### Article 1: Clinical Pharmacist Evaluation of Medication Inappropriateness in a Geriatric Hospital

**Author(s):** Domiati S., Poushuju R.

**ARTICLE TITLE:** Clinical Pharmacist Evaluation of Medication Inappropriateness in a Geriatric Hospital

**JOURNAL:** Annales Pharmaceutiques Francaises

**YEAR:** 2022

**PUBLICATION INFO:** DOI: 10.1016/j.pharma.2022.03.001

**THEME / SUBTHEME:** Health and Wellbeing/ Clinical Pharmacy and Practice

**ABSTRACT**

**Background**
Potentially inappropriate prescribing (PIP) in elderly patients is highly prevalent and is associated with an increased risk of adverse drug events, morbidity, and mortality. Accordingly, this study aimed to evaluate the PIP encountered in a geriatric setting and to highlight the role of the clinical pharmacists in this context.

**Method**
A retrospective observational study was conducted during March and April 2018 in an elderly daycare in Beirut area. Patients’ files were screened to evaluate each patient’s clinical status using a developed tool that included the Medication Appropriateness Index. Statistical analysis was performed using SPSS (version 20). The results were considered significant at $P < 0.05$.

**Results**
The results showed a high incidence of hypertension, schizophrenia, and diabetes among the studied sample with percentages of 41.7%, 35.3%, and 26.6%, respectively. As for the PIP, drug therapy duration and cost were the most encountered problems followed by medication indication, dosage, and drug-drug interaction. Moreover, PIP increased with the number of prescribed medications ($P < 0.05$). Proton pump inhibitors, low dose aspirin, and antidiabetic medications’ users had a significantly higher Medication Appropriateness Index score as compared to non-users.

**Conclusion**
As a conclusion, suboptimal care is proved in this study empowering the collaboration between clinical pharmacists and physicians in minimizing the PIPs in elderly daycares.

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### Article 2: Construction and Evaluation of an Online Module Addressing Counseling Patients with Diabetes Observing Religious Fasting

**Author(s):** Amin M., Qudah B., Kaur A., Rawy M., Chewning B.

**ARTICLE TITLE:** Construction and Evaluation of an Online Module Addressing Counseling Patients with Diabetes Observing Religious Fasting

**JOURNAL:** Currents in Pharmacy Teaching and Learning

**YEAR:** 2021

**PUBLICATION INFO:** 13(12): 1602-1610

**THEME / SUBTHEME:** Health and Wellbeing/ Clinical Pharmacy and Practice

**ABSTRACT**

**Introduction**
Little research has been conducted on training students of different health professions to deliver culturally appropriate care to patients observing religious fasting. This study aimed to formulate an online educational module on caring for patients with diabetes observing religious fasting and evaluate the module’s impact.

**Methods**
Third-year doctor of pharmacy students participated in an online module at the end of their core pharmacist-patient communication class. The module involved discussions and case scenarios addressing Muslim, Jewish, and Hindu patients with diabetes considering fasting. Students were provided with Ramadan Communication (RAMCOM), a tool designed to facilitate counseling of patients on religious fasting and were encouraged to use principles of motivational interviewing in addressing cases. A 13-item questionnaire was administered before and after the module. Answers provided on an open-ended item addressing students’ experiences with the module were analyzed qualitatively using conventional content analysis.

**Results**
Of 140 students taking the class, all students completed the module and 135 completed both questionnaires. The module elicited a statistically significant improvement in confidence across all 13 survey items. The computed aggregate score increased from 2.65 (0.56) to 3.66 (0.50) ($P < .001$), with 71% of students finding the module to be useful or extremely useful. Qualitative analysis provided insight into students’ experiences, including how the module produced an improvement in student confidence as well as opportunities for module improvement.

**Conclusions**
A brief online module significantly improved pharmacy students' confidence in working with patients from different cultures and religions considering religious fasting.
ARTICLE TITLE  Coronavirus Disease Patients’ Views and Experiences of Pharmaceutical Care Services in Lebanon

JOURNAL  International Journal of Pharmacy Practice

YEAR  2021

PUBLICATION INFO  20: 1-4

THEME / SUBTHEME  Health and Wellbeing/ Clinical Pharmacy and Practice

ABSTRACT  

Objectives
This study aimed to explore the experiences and views of domiciliary coronavirus disease (COVID-19) patients towards pharmaceutical care services provided during their infection.

Methods
This was a single-centred observational study conducted among home-treated COVID-19 patients (n = 500), who were tested positive for COVID-19 in a medical centre in Lebanon.

Key Findings
Out of the 500 home-treated COVID-19 patients invited to participate in the study, 279 patients completed the questionnaire. Although the participants had a good view of pharmacists caring for COVID-19 patients (mean view score: 17.79/25), their treatment experiences were unsatisfactory (mean experience score: 1.51/4).

Conclusions
COVID-19 patients reported minimal involvement of pharmacists in their treatment. Therefore, in response to the COVID-19 pandemic, healthcare authorities should intervene in restructuring, guiding and reviewing unrealized new pharmaceutical services to COVID-19 outpatients.

ARTICLE TITLE  Determining Post-operative Morbidity and Mortality Following Gynecological Oncology Surgery: Protocol for a Multicenter, International, Prospective Cohort Study (Global Gynaecological Oncology Surgical Outcomes Collaborative-GO SOAR)

JOURNAL  International Journal of Gynecological Cancer

YEAR  2021

PUBLICATION INFO  31(9):1287-1291

THEME / SUBTHEME  Health and Wellbeing/ Therapies

ABSTRACT  

Background
The Global Gynaecological Oncology Surgical Outcomes Collaborative (GO SOAR) aims to develop a network of gynecological oncology surgeons, surgical departments, and other interested parties that will have the long-term ability to collaborate on outcome studies. The protocol for the first collaborative study is presented here.

Primary Objective
To evaluate international variation in 30-day post-operative morbidity and mortality following gynecological oncology surgery between very high/high and medium/low human development index country settings.

Hypothesis
There is no variation in post-operative morbidity and mortality following gynecological oncology surgery between very high/high and medium/low human development index country settings.

Study Design
International, multicenter, prospective cohort study. Patient data will be collected over a consecutive 30-day period through gynecological oncology multidisciplinary teams/tumor boards and clinics across different human development index country groups. All data are collected on a customized, secure, password protected, central REDCap database.

Major Inclusion/Exclusion Criteria
Inclusion criteria include women aged ≥18 years undergoing elective/emergency, curative/palliative surgery for primary/recurrent tubo-ovarian/peritoneal, endometrial, cervical, vulval, vaginal, gestational trophoblastic malignancies. Surgical modality may be open, minimal access (laparoscopic/robotic), or vaginal.
## ABSTRACT

**Primary Endpoint**
30-day post-operative morbidity and mortality defined as per Clavien-Dindo classification system.

**Sample Size**
1100 (550/arm).

**Estimated Dates for Completing Accrual and Presenting Results**
It is estimated recruitment will be completed by 2022 and results published by 2023.

**Trial Registration**

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## Article Title
Dietary Supplements Intake During the Second Wave of COVID-19 Pandemic: A Multinational Middle Eastern Study

**JOURNAL**
European Journal of Integrative Medicine

**YEAR**
2022

**PUBLICatonInfo**
DOI: 10.1016/j.eujim.2022.102102

**THEME / SUBTHEME**
Health and Wellbeing/Therapies

**ABSTRACT**

**Introduction**
Despite the controversy about the benefits of dietary supplements in treating or preventing COVID-19, their use has increased worldwide even with the introduction of relevant vaccines. Thus, this study aimed to investigate the perception of the Middle Eastern Arab public of dietary supplements as prophylactic or therapeutic agents against COVID-19, and their consumption during the second wave of the COVID-19 pandemic.

**Methods**
A validated, pilot tested online survey was distributed through social networking platforms in Lebanon, the Kingdom of Saudi Arabia, Palestine, Jordan, and the United Arab Emirates. Responses underwent various statistical analyses.

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## Results
A total of 2,100 responses were included. Around 44% of participants reported changes in their dietary behavior during COVID-19, and 70% believed that healthy habits may prevent the infection. Moreover, 21% believed that dietary supplements surely protect against COVID-19 and 45% thought they aid in treating it. Users of supplements during the second wave of the pandemic counted for 47%, who declared they were influenced by the media, healthcare providers, or close contacts. The most used supplements included Vitamins C and D and zinc. Only 34% of participants read supplement leaflets. The use of supplements was significantly correlated with being female and exercising, as revealed by the odds ratio and logistic regression analysis.

**Conclusions**
In line with other areas of the world, the use of dietary supplements in the Middle East against COVID-19 is not evidence-based. Competent health authorities should play their role in spreading sound awareness among the public regarding this issue.
**ARTICLE TITLE**

Diverging Levels of COVID-19 Governmental Response Satisfaction Across Middle Eastern Arab Countries: A Multinational Study [Joint Publication with the Faculty of Medicine]

**JOURNAL**

BMC Public Health

**YEAR**

2022

**PUBLICATION INFO**

DOI: 10.1186/s12889-022-13292-9

**THEME / SUBTHEME**

Health and Wellbeing/ Clinical Pharmacy and Practice

**ABSTRACT**

**Background**

Public acceptance of governmental measures are key to controlling the spread of infectious diseases. The COVID-19 pandemic has placed a significant burden on healthcare systems for high-income countries as well as low- and middle-income countries (LMICs). The ability of LMICs to respond to the challenge of the COVID-19 pandemic has been limited and may have affected the impact of governmental strategies to control the spread of COVID-19. This study aimed to evaluate and compare public opinion on the governmental COVID-19 response of high and LMICs in the Middle East and benchmark it to international countries.

**Methods**

An online, self-administered questionnaire was distributed among different Middle Eastern Arab countries. Participants' demographics and level of satisfaction with governmental responses to COVID-19 were analyzed and reported. Scores were benchmarked against 19 international values.

**Results**

A total of 7395 responses were included. Bahrain scored highest for satisfaction with the governmental response with 38.29 ± 2.93 on a scale of 40, followed by the Kingdom of Saudi Arabia (37.13 ± 3.27), United Arab Emirates (36.56 ± 3.44), Kuwait (35.74 ± 4.85), Jordan (23.08 ± 6.41), and Lebanon (15.39 ± 5.28). Participants' country of residence was a significant predictor of the satisfaction score (P < 0.001), and participants who suffered income reduction due to the pandemic, had a history of SARS-CoV-2 infection, and held higher educational degrees had significantly lower satisfaction scores (P < 0.001).

When benchmarked with other international publics, countries from the Gulf Cooperation Council had the highest satisfaction level, Jordan had an average score, and Lebanon had one of the lowest satisfaction scores.

**Conclusion**

The political crisis in Lebanon merged with the existing corruption were associated with the lowest public satisfaction score whereas the economical instability of Jordan placed the country just before the lowest position. On the other hand, the solid economy plus good planning and public trust in the government placed the other countries of the Gulf Cooperation Council on top of the scale. Further investigation is necessary to find out how the governments of other low-income countries may have handled the situation wisely and gained the trust of their publics. This may help convey a clearer picture to Arab governments that have suffered during the pandemic.

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**ARTICLE TITLE**

Evaluation of Drug Use Pattern in Pediatric Outpatient Clinics in a Tertiary Teaching Hospital Using WHO Drug-Prescribing Indicators

**JOURNAL**

Journal of Multidisciplinary Healthcare

**YEAR**

2022

**PUBLICATION INFO**

15: 1143-1151

**THEME / SUBTHEME**

Health and Wellbeing/ Clinical Pharmacy and Practice

**ABSTRACT**

**Purpose**

The main aim of the study is to assess physicians’ prescribing patterns using the World Health Organization (WHO) prescribing indicators among pediatric outpatient clinics, and to identify areas in need of intervention regarding the rational use of medicines among pediatric outpatients in Jordan.

**Methods**

This is a descriptive observational cross-sectional study that was conducted at the outpatient pediatric clinics at Jordan University Hospital (JUH). During the study period, prescriptions were collected over a period of two months. Prescribing patterns were assessed using the five WHO drug prescribing indicators.

**Results**

A total of 1011 prescriptions/encounters were assessed. More than half of the encounters were for male patients (n= 595, 58.9%), and the median age of patients was eight years (IQR = 7.9). The average number of drugs prescribed per encounter was 1.8 ± 1.3; however, a specific individual clinic, the respiratory clinic, witnessed an average of 2.1 drugs prescribed per encounter. All of the prescribed drugs were prescribed by generic name (100%). Only 47.7% of the drugs were from the essential drug list of the JUH.
### FTICR/MS Analysis of Micromeria Fruticosa and Teucrium Polium Growing in Lebanon

**Author(S)**
Al-Hamwi M., Aboul Ela M., El-Lakany A., Bakkour Y., Mahmoud Z.

**Article Title**
FTICR/MS Analysis of Micromeria Fruticosa and Teucrium Polium Growing in Lebanon

**Journal**
Pharmacognosy Journal

**Year**
2022

**Publication Info**
14(1): 112-127

**Theme/Subtheme**
Health and Wellbeing/Drug Discovery

**Abstract**
Micromeria fruticosa and Teucrium polium are Lamiaceae plants found throughout the Mediterranean, including Lebanon. Aerial parts of both plants were taken from a rocky mountain in Lebanon's Bekaa region and alcoholic extraction and chromatographic separation were performed. Fourier transform ion cyclotron resonance mass spectrometry (FTICR-MS) was used to examine crude extracts of both plants A and B, as well as their fractions. The mass spectra of both plants revealed great chemical complexity with a total of 6352 ions (peaks) for crude extract of plant A and 5147 ions (peaks) for extract B. The majority of chemicals found in both plants are condensed aromatics, particularly polyphenols which could explain the previously documented anticancer effects of both plants.

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### Genus Melaleuca: Phytochemistry, Pharmacology and Effect Against COVID-19

**Author(S)**
Kanso M., Aboul Ela M., El-Lakany A., Hijazi M.

**Article Title**
Genus Melaleuca: Phytochemistry, Pharmacology and Effect Against COVID-19

**Journal**
BAU Journal - Health and Wellbeing

**Year**
2022

**Publication Info**
4(2): 1-15

**Theme/Subtheme**
Health and Wellbeing/Drug Discovery

**Abstract**
Medicinal plants are used for the prevention and treatment of many diseases as they are rich in phytochemical constituents (like terpenes, flavonoids, and alkaloids) responsible for the pharmacological effects of these plants. Genus Melaleuca named the tea tree, belonging to the family Myrtaceae, is cultivated in Australia as well as in the Pacific and some regions of Asia. It has been employed in Australian traditional medicine for its broad antimicrobial activity because of its contents of phenolic compounds, monoterpenes, tannins, flavonoids, sesquiterpenes, and essential oils. Owing to the valuable uses of plants of genus Melaleuca, for different medical purposes, it was deemed interest to summarize the previous studies reported from 2004 to 2020 in the available literature about the phytochemistry and pharmacological potential of both volatile and non-volatile components of Melaleuca species. Accordingly, this article may help researchers work on plants of genus Melaleuca to promote clinical applications towards the development of novel drugs of diverse pharmacological activities, including inhibitory effects on COVID 19 obtained from Melaleuca species.

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**Conclusion**
This study revealed some adequate prescribing habits with an optimal prescribing pattern of generics and number of drugs per encounter among pediatric patients. However, the prescribing patterns of the essential drug list, antibiotics, and injectibles, in specific clinics, failed to meet WHO standards. The findings of this study shed light on the need to establish national strategies to improve prescribing practices among the pediatric population.

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Overall, antibiotics were prescribed in 19.5% of the encounters, but at higher rates in some clinics such as respiratory clinics (50.8%). Injectables were prescribed in 9.5% of the 1011 encounters; however, they were prescribed at higher rates in endocrinology and neurology clinics, in 44.8% and 31.3% of encounters, respectively.

**Conclusion**
This study revealed some adequate prescribing habits with an optimal prescribing pattern of generics and number of drugs per encounter among pediatric patients. However, the prescribing patterns of the essential drug list, antibiotics, and injectibles, in specific clinics, failed to meet WHO standards. The findings of this study shed light on the need to establish national strategies to improve prescribing practices among the pediatric population.
**ARTICLE TITLE**
Home Delivery of Medications: Community Pharmacists’ Perspectives on the Pros and Cons of the Service

**JOURNAL**
Frontiers in Public Health

**YEAR**
2022

**PUBLICATION INFO**
DOI: 10.3389/fpubh.2022.966145

**THEME / SUBTHEME**
Health and Wellbeing/ Clinical Pharmacy and Practice

**ABSTRACT**
Objectives
The main goal of the current study was to investigate pharmacists’ perception of home delivery of medications service in Jordan and their willingness to use the service.

Method
This cross-sectional observational study was conducted between March and April 2022. The study targeted community pharmacists working at different community pharmacies across Jordan. The study questionnaire was distributed through Facebook to target Jordanian community pharmacists’ groups.

Results
Three hundred and twenty-four community pharmacists participated in the study, 75% (n = 244) of pharmacists reported being willing to use the home delivery and 274 (84.6%) thought it increases the efficiency of their community pharmacies’ services. Only 129 (39.8%) pharmacists agreed or strongly agreed that unlike in-store service, home delivery of medications is suitable only for OTC but not for prescriptions medications. Nearly half the number of participating pharmacists (n = 153, 47.2%) believe that the service is suitable for refill prescriptions but not for new prescriptions. Pharmacists believe that the foremost pros of the service were to continue life-saving medical treatment (n = 249, 76.9%), serve sick, elderly, and disabled patients (n = 241, 74.4%), and decrease congestion at health facilities (n = 228, 70.4%). On the other hand, the cons of this service, as perceived by pharmacists included failing to build a professional relationship with patients (n = 203, 62.7%), and the contribution to communication errors (n = 147, 45.4%). Logistic regression showed that pharmacists who serve 50 patients or more per day were more willing to use the service than those serving less than 50 patients per day (OR = 2.058, P = 0.032).

Conclusion
The majority of participating pharmacists in this study were willing to use the service at their community pharmacies, especially those serving a large number of patients per day which may indicate the potential of this service in relieving the pressure on community pharmacies and allowing them to serve more patients efficiently.

**ARTICLE TITLE**
Is Daycare a Safe Place for Kids During Covid-19 Pandemic? Opinion of the Lebanese Middle to Low Economic Status Mothers

**JOURNAL**
BAU Journal-Health and Wellbeing

**YEAR**
2021

**PUBLICATION INFO**
3(3): 1-8

**THEME / SUBTHEME**
Health and Wellbeing/ Clinical Pharmacy and Practice

**ABSTRACT**
Purpose
COVID-19 pandemic has negatively impacted the whole society including mothers who struggled between paid work, housework, and full-time childcare. Daycare used to relieve part of this burden. Accordingly, the current study aimed to assess the mothers’ acceptability of sending their children to daycare and the factors that influenced the decision.

Subject and Method
A cross-sectional questionnaire-based study was carried out through phone calls in November 2020. Lebanese mothers of children from 0 to 3 years were invited to participate in the study. The questionnaire included demographic data, perception of the ways of COVID-19 transmission, Snyder’s Hope Scale, and acceptability of mothers to send their children to daycare. Data was analysed using SPSS-version 20. Results were considered significant at p-value ≤0.05 with a confidence interval of 95%.

Results
Results showed a good knowledge of the way of transmission of SARS-CoV-2. Nevertheless, food and drinks as well as pets were retrieved as a source of transmission in 66.2 and 3.1%, respectively. Mothers average hope reflects their neutrality in agreeing in quarantining and even their disagreement. Accordingly, 62% of the mothers agreed on sending their kids to daycare to overcome their confronted barriers; mainly to go to work.

Conclusion
All the results reflect the high burden of raising children without institutional support as well as financial one which the mothers are exposed to during the COVID-19 pandemic. Consequently, daycare must reopen their doors, with special precautions, to relieve the burden on mothers. Moreover, the government must support daycare institutions economically to be affordable to a larger sample of low to middle-income families.
Mechanisms Underlying the Effects of Caloric Restriction on Hypertension

**ARTICLE TITLE**
Mechanisms Underlying the Effects of Caloric Restriction on Hypertension

**JOURNAL**
Biochemical Pharmacology

**YEAR**
2022

**PUBLICATION INFO**
DOI: 10.1016/j.bcp.2022.115035

**THEME / SUBTHEME**
Health and Wellbeing/Therapies

**ABSTRACT**
Hypertension is a major risk factor for cardiovascular disease (CVD) as well as a major contributor to all-cause mortality and disability worldwide. The pathophysiology of hypertension is highly attributed to a dysfunctional endothelium and vascular remodeling. Despite the wide use of pharmacological therapies that modulate these pathways, a large percentage of patients continue to have uncontrolled hypertension, and the use of non-pharmacological interventions is increasingly investigated. Among these, caloric restriction (CR) appears to be a promising nutritional intervention for the management of hypertension. However, the mechanisms behind this effect are not yet fully understood, although an evolving view supports a significant impact of CR on vascular structure and function, specifically at the level of vascular endothelial cells, vascular smooth muscle cells along with their extracellular matrix (ECM). Accumulating evidence suggests that CR promotes endothelium-dependent vasodilation through activating eNOS and increasing nitric oxide (NO) levels through multiple cascades involving modulation of oxidative stress, autophagy, and inflammation. Indeed, CR diminishes phenotypic shift, and suppresses proliferation and migration of VSMCs via pathways involving NO and mTOR. By regulating transforming growth factor-β and matrix metalloproteinases, CR appears to reduce ECM and collagen deposition in vascular walls. Here, we offer a detailed discussion of how these mechanisms contribute to CR’s influence on reducing blood pressure. Such mechanisms could then provide a valuable foundation on which to base new therapeutic interventions for hypertension.

Novel Fast Analytical Methods for the Analysis of Fluoxetine in Pure and Pharmaceutical Dosage Form

**ARTICLE TITLE**
Novel Fast Analytical Methods for the Analysis of Fluoxetine in Pure and Pharmaceutical Dosage Form

**JOURNAL**
BAU Journal-Science and Technology

**YEAR**
2022

**PUBLICATION INFO**
3(2): 1-12

**THEME / SUBTHEME**
Science and Technology/Drug Delivery and Development

**ABSTRACT**
Novel and accurate analytical methods were developed and validated for the characterization of Fluoxetine in its pure and pharmaceutical dosage form Prozac®. Fluoxetine was determined by IBA techniques (PIGE, PIXE and RBS). It has been also analyzed spectrophotometrically at 610 nm after oxidation with potassium permanganate in alkaline medium. In addition, Fluoxetine was kinetically determined using the initial rate method, the fixed absorbance method and the fixed time method. Moreover, a Gas chromatography - mass spectrometry technique is proposed for the investigation of Fluoxetine without a prederivatization phase. The spectrophotometric method was performed with a concentration array of 2-10 μg/mL at 610 nm and a regression coefficient (r) of 0.996. The fixed time method was the most suitable one to determine Fluoxetine with correlation coefficient value (r) of 0.9966. The Gas chromatography - mass spectrometry investigated the drug in a concentration range of 20-100 μg/mL and a regression coefficient (r) of 0.999. IBA analysis presented a precision of less than 3% and a very low limit of detection. Consequently, these proposed methods would be useful tools for determining Fluoxetine as all the assay results exposed satisfactory sensitivity, accuracy and reproducibility.
ARTICLE TITLE
Origanum syriacum L. Attenuates the Malignant Phenotype of MDA-MB231 Breast Cancer Cells

JOURNAL
Frontiers in Oncology

YEAR
2022

PUBLICATION INFO
DOI: 10.3389/fonc.2022.922196

THEME / SUBTHEME
Health and Wellbeing/Therapies

ABSTRACT
Breast cancer is the leading cause of cancer-related deaths among women. Among breast cancer types, triple negative breast cancer (TNBC) is the most aggressive, and is resistant to hormonal and chemotherapeutic treatments. As such, alternative approaches that may provide some benefit in fighting this debilitating pathology are critically needed; hence the utilization of herbal medicine. Origanum syriacum L., one of the most regularly consumed plants in the Mediterranean region, exhibits antiproliferative effect on several cancer cell lines. However, whether this herb modulates the malignant phenotype of TNBC remains poorly investigated. Here, we show that in MDA-MB-231, a TNBC cell line, Origanum syriacum L. aqueous extract (OSE) inhibited cellular viability, induced autophagy determined by the accumulation of lipidized LC3 II, and triggered apoptosis. We also show that OSE significantly promoted homotypic cell-cell adhesion while it decreased cellular migration, adhesion to fibronectin, and invasion of MDA-MB-231 cells. This was supported by decreased activity of focal adhesion kinase (FAK), reduced α2 integrin expression, and downregulation of secreted PGE2, MMP2 and MMP-9, in OSE-treated cells. Finally, we also show that OSE significantly inhibited angiogenesis and downregulated the level of nitric oxide (NO) production. Our findings demonstrate the ability of OSE to attenuate the malignant phenotype of the MDA-MB-231 cells, thus presenting Origanum syriacum L. as a promising potential source for therapeutic compounds for TNBC.

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ARTICLE TITLE
Pharmacy-Related Research for Health in the Arab Region: An Analysis Informed by WHO’s Global Strategy on Research for Health

JOURNAL
Exploratory Research in Clinical and Social Pharmacy

YEAR
2022

PUBLICATION INFO
DOI: 10.1016/j.rcsop.2021.100099

THEME / SUBTHEME
Health and Wellbeing/Clinical Pharmacy and Practice

ABSTRACT
In 2012, WHO (the World Health Organisation) published a strategy on research for health based on the premise that policies and practices in support of health worldwide should be grounded in the best scientific knowledge derived from high-quality research. This strategy focuses attention on five interrelated goals: organisation, capacity, priorities, standards, and translation.1 Whilst knowledge production and publication in many Arab countries have been on the rise, the overall global share of the Arab region in health research publication is smaller than its global share of population or wealth.2 Inspired by the five WHO goals on research for health, this commentary shares factors and recommendations for consideration to enhance pharmacy-related research in the Arab region. These recommendations include establishing strategies for pharmacy-related research to address the context and local needs of the host country, creating intranational and intraregional collaborative research avenues, investing in research capacity, and fostering a culture of research in the workplace.

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ARTICLE TITLE
Prevalence, Risk Factors, and Management Practices of Primary Dysmenorrhea Among Young Females

JOURNAL
BMC Women’s Health

YEAR
2021

PUBLICATION INFO
DOI: 10.1186/s12905-021-01532-w

THEME / SUBTHEME
Health and Wellbeing/Clinical Pharmacy and Practice

—
Primary dysmenorrhea (PD) is one of the most common gynecological conditions among young females, which has a significant negative impact on health-related quality of life and productivity. Despite its high prevalence, the evidence is limited regarding the management-seeking practices and its perceived effectiveness among females with PD.

Methods
This is a cross-sectional study conducted among 550 female students in six universities across Lebanon. The prevalence of PD, associated risk factors, and management-seeking practices were assessed using a self-administered questionnaire.

Results
The prevalence of PD was 80.9%. Most of the females with PD described their menstrual pain as moderate (56%) to severe (34.6%), which significantly affected their daily activities and studying ability (P < 0.001). The major risk factors associated with PD included heavy menstrual flow (adjusted odds ratio [AOR] = 10.28), family history of PD (AOR = 2.52), history of weight loss attempt (AOR = 2.05), and medical specialization (AOR = 1.663). Only 36.9% of females with PD sought formal medical advice. Most dysmenorrheic females (76.4%) received medications for the management of PD, and remarkably none of them took hormonal contraceptives. Drugs commonly used for PD were mefenamic acid (26.2%), ibuprofen (25%), and paracetamol (11.5%), which were administered when the pain started (58.2%). All medications were significantly effective in reducing the pain score (P = 0.001), and most NSAIDs were more potent than paracetamol in managing PD (P = 0.001). However, no significant difference in adverse effects among medications was revealed. Moreover, no superiority of any individual NSAID for pain relief was established. Nevertheless, mefenamic acid was associated with the lowest risk of abdominal pain (OR: 0.03, P = 0.005) and the highest risk of flank pain (OR = 12, P = 0.02).

Conclusions
Suboptimal management of PD is practiced among university students in Lebanon. Therefore, health care providers should educate dysmenorrheic females to optimize the self-management support of PD. Furthermore, future research is required to investigate females’ misconceptions about hormonal contraceptives in the management of PD, aiming to raise awareness and correct misconceptions.
ARTICLE TITLE
Provision of Pharmaceutical Care to Suspected High-Risk COVID-19 Patients Through Telehealth: A Nationwide Simulated Patient Study

JOURNAL
BMC Health Services Research

YEAR
2021

PUBLICATION INFO
DOI: 10.1186/s12913-021-07014-x

THEME / SUBTHEME
Health and Wellbeing/ Clinical Pharmacy and Practice

ABSTRACT
Background
The COVID-19 pandemic has overburdened the healthcare facilities, which demanded the use of alternative and effective methods for delivering healthcare services. The use of telehealth has become a necessity to provide initial health services.

Objective
To identify the pharmaceutical care provided by community pharmacists to suspected high-risk COVID-19 patients using telehealth.

Methods
A simulated patient (SP) phoned 100 randomly-selected community pharmacies throughout Lebanon using a standard scenario of uncontrolled diabetes mellitus with typical symptoms of COVID-19. Pharmacists’ responses were compared with pre-defined ideal recommendations using a special form.

Results
The mean of the retrieved medical information score obtained by the pharmacists was 2.48 ± 2.79 (out of 21), with 34 % of the participants not retrieving any relevant medical data from the SP. The relative patient information, the exposure to COVID-19, and the possible COVID-19 symptoms were not retrieved by 61 %, 70 %, and 41 % of the pharmacists, respectively. Two percent of the pharmacists assured that the SP’s symptoms were related to common cold, while 5 % confirmed that the SP is infected with COVID-19. Notably, 35 % of the pharmacists did not offer any recommendation. Among them, 14 % claimed that they were too busy to respond. Only 39 % of the pharmacists provided an appropriate recommendation by referring the SP to her physician to seek medical attention within 24 h since the SP is a high-risk patient, and 41 % recommended doing a PCR test. Antipyretics, antibiotics, and dietary supplements were recommended by 27 %, 7 %, and 16 % of the pharmacists, respectively. Less than 16 % of the pharmacists recommended using protective measures against COVID-19. In addition, the overall communication skills of the pharmacists were generally below expectations.

Conclusions
This study is the first to assess the quality of pharmaceutical care provided by community pharmacists in the Middle East via Telehealth. An unsatisfactory level of preparedness through means of telehealth technology was evident. This resulted in the quality of pharmaceutical-care services provided to high-risk patients via telehealth to be below expectations. Therefore, health authorities should encourage community pharmacists to effectively adopt telehealth, by providing appropriate training, as well as recognizing their extra efforts with financial compensations, aiming to optimize patients’ health outcomes.

Author(S)
Itani R., Khojah H., Jaffal F., Rahme D., Karout L., Karout S.
Public Perceptions About Home Delivery of Medication Service and Factors Associated with the Utilization of This Service

**ARTICLE TITLE**

Public Perceptions About Home Delivery of Medication Service and Factors Associated with the Utilization of This Service

**JOURNAL**

Patient Preference and Adherence

**YEAR**

2022

**PUBLICATION INFO**

DOI: 10.2147/PPA.S377558

**THEME / SUBTHEME**

Health and Wellbeing/ Clinical Pharmacy and Practice

**ABSTRACT**

Introduction

Home medication delivery service is a major service for the public. It reduces overcrowding and unnecessary visits to health centers. This study aims to investigate the public perception of home delivery of medication service in Jordan and evaluate factors affecting the use of this service.

Methods

The study was conducted in March 2022 using an online survey. Participants were asked to fill out a validated questionnaire to evaluate their perception of home delivery of medication service.

Results

Among the 1032 adult participated in this study, the majority reported that they had heard of home delivery of medication service (n = 832, 80.6%). However, only 30.9% of them have used this service before. Results showed that 71.6% of the participants (n = 737) believe that home delivery of medication service is more convenient and accessible than in-store drug refill. In addition, 65.6% of the participants (n = 677) believed that home delivery of medication service is suitable only for refill-prescription drugs (65.0%). The main pros of the service as perceived by the study participants were to serve sick patients, elderly, and disabled people (n = 822, 79.7%). In contrast, the inability of patients to build a professional relationship with pharmacists using home delivery of medication service was the most perceived con of this service (n = 821, 78.1%). Finally, regression analysis revealed that older participants, those with chronic diseases, and those who visit community pharmacies two times or more per month revealed higher use of the service (P < 0.05).

**Author(s)**

Abu-Farha R., Alzoubi K., Rizik M., Karout S., Itani R., Mukattash T., Alefishat E.
<table>
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<tr>
<th>ARTICLE TITLE</th>
<th>Superiority of Microemulsion-Based Hydrogel for Non-steroidal Anti-inflammatory Drug Transdermal Delivery: A Comparative Safety and Anti-nociceptive Efficacy Study</th>
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<tr>
<td>YEAR</td>
<td>2022</td>
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<tr>
<td>PUBLICATION INFO</td>
<td>DOI: 10.1016/j.ijpharm.2022.121830</td>
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<td>THEME / SUBTHEME</td>
<td>Health and Wellbeing/ Drug Discovery</td>
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<tr>
<td>ABSTRACT</td>
<td>Non-steroidal anti-inflammatory drugs (NSAIDs) represent the foundation of pain management caused by inflammatory disorders. Nevertheless, their oral administration induces several side effects exemplified by gastric ulceration, thus, delivering NSAIDs via skin has become an attractive alternative. Herein, microemulsion-based hydrogel (MBH), proliposomal, and cubosomal gels were fabricated, loaded with diclofenac, and physicochemically characterized. The size, charge, surface morphology, and the state of diclofenac within the reconstituted gels were also addressed. The ex-vivo permeation study using Franz cells was performed via the rat abdominal skin. The formulations were assessed in-vivo on mice skin for their irritation effect and their anti-nociceptive efficacy through tail-flick test. Biosafety study of the optimal gel was also pointed out. The gels and their dispersion forms displayed accepted physicochemical properties. Diclofenac was released in a prolonged manner from the prepared gels. MBH revealed a significantly higher skin permeation and the foremost results regarding in-vivo assessment where no skin irritation or altered histopathological features were observed. MBH further induced a significant anti-nociceptive effect during the tail-flick test with a lower tendency to evoke systemic toxicity. Therefore, limonene-containing microemulsion hydrogel is a promising lipid-based vehicle to treat pain with superior safety and therapeutic efficacy.</td>
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<th>ARTICLE TITLE</th>
<th>The Effect of the Emerging Omicron Variant on the Willingness to Take or Continue with COVID-19 Vaccination in the Middle East</th>
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<td>JOURNAL</td>
<td>Journal of Applied Pharmaceutical Science</td>
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<td>YEAR</td>
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<td>PUBLICATION INFO</td>
<td>DOI: 10.7324/JAPS.2022.121005</td>
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<td>THEME / SUBTHEME</td>
<td>Health and Wellbeing/ Therapies</td>
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<tr>
<td>ABSTRACT</td>
<td>The present study aimed to explore the willingness of the general public in the Middle East area to take or continue with the available COVID-19 vaccine in light of the emergence of the new omicron variant. This study is a web-based questionnaire distributed in Lebanon, Jordan, and Kuwait during the omicron variant outbreak. The questionnaire consisted of 15 close-ended questions with predefined options, divided into four sections preceded. The total included responses were 812 that were recruited from Lebanon (n = 427, 52.6%), Jordan (n = 279, 34.4%), and Kuwait (n = 106, 13.1%). Almost two-thirds of the participants (77%) received two doses of the COVID-19 vaccine, while only 7.9% received the booster shot (third dose). On the other hand, 90 participants (11%) did not receive any COVID-19 vaccine yet. The reported willingness among the unvaccinated individuals to receive the COVID-19 vaccine was only 22.4% (20/90). However, higher acceptability of fully vaccinated individuals to receive the COVID-19 vaccine was only 22.4% (20/90). However, higher acceptability of fully vaccinated individuals to receive the booster shot was reported after the surge of the omicron variant (49.2%). The findings of the present study have important implications on COVID-19 vaccination decision. As the pandemic evolves, the public’s opinions with the surge of different variants are changing. Therefore, there is an urgent need to raise awareness about omicron severity, and that the rapidly spreading strain puts the unvaccinated particularly at risk. Vaccine campaigns should elevate the voices of influencing messengers caring for severe COVID-19 cases.</td>
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Therapeutic Potential of Flavonoids in Cancer: ROS-Mediated Mechanisms

Cancer is a leading cause of morbidity and mortality around the globe. Reactive oxygen species (ROS) play contradicting roles in cancer incidence and progression. Antioxidants have attracted attention as emerging therapeutic agents. Among these are flavonoids, which are natural polyphenols with established anticancer and antioxidant capacities. Increasing evidence shows that flavonoids can inhibit carcinogenesis via suppressing ROS levels. Surprisingly, flavonoids can also trigger excessive oxidative stress, but this can also induce death of malignant cells. In this review, we explore the inherent characteristics that contribute to the antioxidant capacity of flavonoids, and we dissect the scenarios in which they play the contrasting role as pro-oxidants. Furthermore, we elaborate on the pathways that link flavonoid-mediated modulation of ROS to the prevention and treatment of cancer. Special attention is given to the ROS-mediated anticancer functions that (-)-epigallocatechin gallate (EGCG), hesperetin, naringenin, quercetin, luteolin, and apigenin evoke in various cancers. We also delve into the structure-function relations that make flavonoids potent antioxidants. This review provides a detailed perspective that can be utilized in future experiments or trials that aim at utilizing flavonoids or verifying their efficacy for developing new pharmacologic agents. We support the argument that flavonoids are attractive candidates for cancer therapy.

Transdermal Delivery of Capsaicin Nanoemulgel: Optimization, Skin Permeation and In Vivo Activity Against Diabetic Neuropathy

Diabetic somatic neuropathy is one of the most prevalent complications in type 1 diabetes mellitus. Many treatments were investigated to alleviate the pain associated with this condition. Capsaicin is a naturally occurring lipophilic alkaloid that proved to be an effective and safe treatment of chronic painful disorders. Despite the known therapeutic benefits of capsaicin, the conventional topical formulations have limited bioavailability. Therefore, the current study aims to develop capsaicin nanoemulgel to increase skin permeation and enhance its activity against neuropathic pain.

Low-energy emulsification method was used to prepare nanoemulsions, using eucalyptus oil as the oily phase, tween 80 as a surfactant, propylene glycol, ethanol and isopropyl alcohol as co-surfactants. Pseudo-ternary phase diagrams were constructed to investigate and optimize the formulation. Subsequently, the optimum formulation was formulated as a nanoemulgel and investigated for, skin permeation using Franz diffusion cell, and diabetic neuropathy management using alloxan-induced diabetic mice.

The selected nanoemulsion containing 0.05% capsaicin is composed of 8 % oil, 24 % Smix (Tween 80: isopropyl alcohol 2:1 w/w) and 68 % water. It is characterized by nanosized globules (28.15±0.24 nm) with a relatively low polydispersity index (0.27±0.05). The nanoemulgel revealed circa 4-fold increase in capsaicin cumulative permeation when compared to the conventional gel, and an improvement in its antinociceptive properties was observed in the treated diabetic mice (p<0.05).

The selected capsaicin nanoemulgel would be a promising transdermal formulation that may alleviate diabetic neuropathy in type 1 diabetes mellitus patients.
Upscaling the Pharmacy Profession: Knowledge and Willingness of the Lebanese Pharmacists to Practice the Administration of Dermal Fillers

**Background**
The rapid global development of the pharmacy profession has led pharmacists to enter the cosmetic industry by administering injectable dermal fillers (DFs) to those in need. However, there is no clear indication that the Lebanese pharmacists are familiar with these procedures or are willing to do so.

**Objectives**
We aimed to investigate the Lebanese community pharmacists’ knowledge about DFs and their willingness to administer them.

**Methods**
A self-administered questionnaire was sent to 461 randomly selected pharmacists who agreed to participate in the study after a phone call. A scoring system for the knowledge about DFs was employed.

**Results**
Only 31.4% of participants reported formal education as the source of knowledge about DFs, and 3.7% of them reported practicing them on patients. The mean score of knowledge was 5.9 ± 2.5 (out of 14). High level of knowledge was observed in only 25% of the participants, where females, older and experienced pharmacists, and those working in Beirut region were more significantly knowledgeable. Around 67% of participants were willing to be trained in this field to expand their field of practice and improve their income.

**Conclusions**
Lebanese community pharmacists are not yet ready for this new dimension in the career. Legislative procedures, training, licensing, and developed pharmacy curriculum must precede the practice of DFs by pharmacists in Lebanon.
## I. PUBLICATIONS
### ARTICLES

<table>
<thead>
<tr>
<th>ARTICLE TITLE</th>
<th>Assessment of Sexual and Reproductive Health Knowledge and Awareness Among Single Unmarried Women living in Lebanon: A Cross-Sectional Study</th>
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</thead>
<tbody>
<tr>
<td>JOURNAL</td>
<td>Reproductive Health</td>
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<tr>
<td>YEAR</td>
<td>2021</td>
</tr>
<tr>
<td>PUBLICATION INFO</td>
<td>DOI: 10.1186/s12978-021-01079-x</td>
</tr>
<tr>
<td>THEME / SUBTHEME</td>
<td>Health and Wellbeing/ Women and Health</td>
</tr>
</tbody>
</table>

### ABSTRACT

**Background**

Sexual and reproductive health (SRH), a globally recognized fundamental health concern and a basic human right is poorly addressed and seldom researched in the Arab world. Disregarding this aspect of health creates various obstacles to accessing SRH related services and education. This threatens the health of a female, namely through increasing the probability of unplanned pregnancies and unsafe abortions, augmenting the risk of acquiring sexually transmitted infections, and most importantly, increasing the hazard of maternal and neonatal death. Thus, this study aimed to assess the level of SRH related knowledge and awareness among single unmarried women living in Lebanon.

**Methods**

A descriptive cross-sectional study design was conducted using a self-administered questionnaire in both English and Arabic languages. The questionnaire included 9 sections; socio-demographic characteristics section, sexually transmitted infections (STIs) section, premarital tests section, vaccines section, menstruation and its abnormalities section, pregnancy symptoms and identification section, methods of contraception section, vitamins section, and honeymoon events section. The questionnaire was distributed among all Lebanese governorates to 491 single unmarried women living in Lebanon aged between 17 and 55 years. Student t-test and Chi-Square test were used to analyze results.

**Results**

It was found that only 8.8% of all the participants had adequate knowledge. The highest level of SRH related knowledge was about pregnancy (88.0%), and the least was about contraception (13.5%). Most of the knowledgeable participants lived in Beirut governorate (13.6%, n = 8) and had reached universities (10.3%, n = 41), but this was not statistically significant (p-value > 0.05). The effect of a prior visit to a gynecologist was statistically non-significant on the overall level of knowledge (p-value = 0.269).
Abstract

Challenges of Telemedicine During the COVID-19 Pandemic: A Systematic Review

Background
The COVID-19 pandemic has prompted the decrease of in-person visits to reduce the risk of virus transmission. Telemedicine is an efficient communication tool employed between healthcare providers and patients that prevents the risk of exposure to infected persons. However, telemedicine use is not infallible; its users reported multiple issues that complicated the expansion of this technology. So, this systematic review aimed to explore the barriers and challenges of telemedicine use during the pandemic and to propose solutions for improving future use.

Methods
A systematic review was conducted following PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) statement. PubMed, Scopus, Web of Science, Academic Search Complete, CINAHL, Embase, and Science Direct were used to look for articles addressing barriers and challenges, in addition to articles proposing solutions. Studies were screened by title and abstract, followed by a full-text review. Risk of bias assessment was done using Critical Appraisal Skills Program for qualitative studies, Newcastle-Ottawa Scale for cross-sectional studies, and A MeaSurement Tool to Assess Systematic Reviews for systematic reviews. After the extraction of data, a narrative synthesis and analysis of the outcomes were performed.

Conclusion
Widespread use of telemedicine is still hampered by various barriers and challenges. Healthcare providers should work with various stakeholders to implement the proposed solutions. More research and policy changes are essential to optimize telemedicine utilization.

Author(s)
Ftouni R., ALJardali B., Hamdanieh M., Ftouni L., Salem N.
**ABSTRACT**

**Recent Findings**
There are many established behavioral and psychological interventions for the treatment of onychophagia, albeit modest in efficacy. And up until today, there is minimal evidence that supports effective pharmacotherapy. However, several of these drugs show promising results that warrant further exploration.

**Summary**
NAC was found to be more effective than placebo in the short term, while SSRIs showed contradictory results. TCAs (especially clomipramine), lithium, and silymarin have also exhibited potential in curbing nail biting behavior to different extents. Further studies are required to outline a definite treatment modality for onychophagia, along with corresponding therapeutic doses.

**Author(S)**
Salem N., El Rawas S. Abou Chahine R., Alwan Z., Halime R., Chehade L., Abdallah M.

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**ABSTRACT**

Both Pdt and Ptt are significantly increased in shisha smokers who smokes more heads of shisha per day with a p value of 0.031 and 0.002 respectively. However, in shisha smokers, the mean number of shisha smoking years was 2.68 years (standard deviation = 5.22). Only Ptt significantly increased (P = 0.007) with more smoking years. Moreover, Pdt and Ptt were significantly higher (P < 0.001) in males than in females. One may conclude that shisha smokers have higher tolerance thresholds for pain than non-smokers.

**Author(S)**

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**ABSTRACT**

Shisha smoking is a common method of tobacco smoking in the Mediterranean Region with prevalence ranging between 20% and 70%. Actually, shisha smoking is becoming increasingly popular method of tobacco smoking worldwide. Pain is a subjective experience influenced by genetic, developmental, familial, psychological, social and cultural variables. An increase in pain tolerance threshold (Ptt), which is defined as the highest intensity of painful stimulation that a tested subject is able to tolerate, was noticed with cigarette smoking. However, the relation between shisha smoking and pain detection threshold (Pdt), defined as the lowest intensity of a painful stimulus at which the subject perceives pain and pain tolerance threshold (Ptt) has not been studied. The purpose of this study was to determine the association between Pdt and Ptt in shisha smokers in Lebanon. A total of 400 participants from different areas in Lebanon were recruited of which 216 were non-smokers and 184 were shisha-smokers. The sphygmomanometer cuff technique was used to detect Pdt and Ptt. As a result, the mean age of these participants was 27.46 years (standard deviation = 11.79). Shisha-smoker male participants represented 53.7% while female shisha-smokers presented 40.8%. Pdt and Ptt were significantly greater in shisha smokers than in non-smokers with P = 0.001 and P < 0.001 respectively. The mean number of heads of shisha smoked was 2.64 heads (standard deviation = 4.78).

**Author(S)**

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**ABSTRACT**

Objective
To explore the practice of infant safe sleep recommendations as defined by the American Academy of Pediatrics (AAP) by mothers in Beirut, Lebanon.

**Materials and Methods**
A total of 87 mothers participated in this study. Data was collected via hard-copy questionnaires distributed at the daycares in Beirut between July 2018 and April 2019.

**Results**
Less than half of the mothers were more likely to place the infants on their back during sleep. Sixty-two percent of mothers reported that they would most likely place their infants on a firm mattress in the crib. Seventy percent of mothers reported that they are likely to have their infants sleep in the same room as them, and 43.7% of participants reported that they are unlikely to have their infants sleep in the same bed as them or with any other adult. Only 8% mentioned that they would never place a pillow in the crib. One-third of participants mentioned that they were more likely to offer a pacifier when putting their infants to sleep.

**Conclusion**
Mothers in Beirut, Lebanon require more awareness regarding safe sleep practices in order to improve compliance with the “Strict definition” of the AAP recommendations. Exploring the preventive advice currently given by health professionals to pregnant women and young parents, as well as assessing the prevalence of safe sleep practices in all Lebanese governorates, will help design and launch awareness campaigns adequately.
Role of Hypoxia-Mediated Autophagy in Tumor Cell Death and Survival

Cancers
2021
DOI: 10.3390/cancers13030533
Health and Wellbeing/ Molecular Biology and Therapeutics of Diseases

Autophagy is a self-eating mechanism that is involved in the degradation of organelles and cellular materials. It is initiated by intracellular and extracellular stress stimuli. In the context of tumor development, microenvironmental hypoxic stress regulates autophagy that, in turn, promotes cancer cell death or cancer cell survival. Autophagy functions and shares molecular players with other cell-death promoting pathways such as apoptosis. Here, we discuss the spatial and temporal control of autophagy that could result in opposing cellular outcomes. We also address the role of immune cells polarization in this context. This knowledge is essential for efficiently targeting autophagy in conjunction with immunotherapy for improved cancer treatment.

The Use of Humour in Medical Education: Students' Perspective

European Journal of Humour Research
2022
10(1): 186-198
Health and Wellbeing/ Medical Education in Medicine

In early 20th century, Sir William Osler supported the use of humour as an efficacious tool in medical education, which continues to be used today. Despite the abundance of literature delineating this important role, it is often overlooked among medical students. A descriptive cross-sectional study was planned where a total of 295 medical students from the pre-clerkship and clerkship phases at Beirut Arab University Faculty of Medicine were included in the study. A questionnaire was distributed among the participants assessing their perception on the use of humour in medical education. Data were collected, entered, and analysed on SPSS software version 23.1. Results with p-value < 0.05 were considered statistically significant. The majority of participants agreed to the implementation of humour in medical education. They supported different forms of humour to be used, and considered mockery, sarcasm, the instructor appearing as a performer, and humour that is irrelevant to the course as inappropriate. Inappropriate humour distracts attention and disrupts the formal atmosphere. Our findings suggest that medical students' opinions on using humour in medical education are supportive.
The findings of this study might be of benefit to assist teachers in using humour to improve the attendance and interest of the students in the class and create an environment conducive to optimal student learning.
## I. PUBLICATIONS

### ARTICLES

<table>
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<th>ARTICLE TITLE</th>
<th>JOURNAL</th>
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<th>PUBLICATION INFO</th>
<th>THEME / SUBTHEME</th>
<th>ABSTRACT</th>
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</table>
| A Comparison Between the Effect of Different Pressures of Air Particle Abrasion Before and After Sintering With and Without Zirconia Liner on Bond Strength of Resin to Zirconia Surface | BAU Journal-Creative Sustainable Development | 2022 | 3(1): 1-6 | Science and Technology/ Towards Digital Dentistry | This study aimed to compare the effect of different pressures of air particle abrasion 2 and 4 bars before and after sintering with and without zirconia liner on SBS of resin to zirconia surface. **Materials and Methods**

54 zirconia cuboids 8x8x3 mm were milled and divided into 6 equal groups (N=9) according to surface treatment; sintered with ceramic liner application and 2 bars pressure (SL2) and with 4 bars pressure (SL4), sintered with no ceramic liner and 2 bars pressure (SN2) and 4 bars pressure (SN4), unsintered with no ceramic liner and 2 bars pressure (UN2) and 4 bars pressure (UN4). Specimens underwent thermocycling (1000 cycles) between 15°C and 55°C Celsius with dwell time of 10 seconds, and submitted to SBS test. Data was statistically analysed.

**Results**

All 4 bars APA groups showed higher SBS than 2 bars groups with significant difference between SL4 group (4.7±2.07) and SL2 group (2.58±1.94). Groups with APA before sintering (12.42±2.56) showed significantly higher SBS than APA after sintering (6.35±3.7). SL2 group showed least SBS with significant difference (2.58±1.94) compared to UN2 (11.83±3.35) and SN2 (7.87±2.12). SL4 group (4.7±2.07) showed the least SBS compared to the UN4 (13±1.38), and SN4 (10.24±2.94) groups.

**Conclusion**

It was found that APA of zirconia surface before sintering yielded superior performance than APA after sintering, also 4 bars APA pressure application showed higher SBS than 2 bars pressure, application and firing of ceramic liner onto zirconia surface didn’t enhance SBS.

| Author(s) | Saadeh L., Farghaly E., Rayyan M., Osman E. |

* Names in Bold Indicate BAU Authors
**ARTICLE TITLE**: Assessment of the Pain Perception Following Piezotome-corticision Assisted Orthodontics During Retraction of Canine (Randomized Clinical Trial)

**JOURNAL**: Egyptian Orthodontic Journal

**YEAR**: 2021

**ABSTRACT**

**Objectives**
The aim of this study to assess the patient perception of pain, discomfort satisfaction after piezotome-corticision assisted.

**Methods**
Fifteen patients were submitted for upper first premolars extraction to facilitate canine retraction. They were randomly divided into test and control side. On the test side the canine was retracted using piezosurgery, while at control side without piezosurgery. Both groups were loaded with 150g for canine retraction. Pain, swelling and discomfort were evaluated at day 1, 3, 5 and 7 after piezosurgery using a questionnaire.

**Results**
At all times, pain was greater in the test side, although the intensity of pain in the test side was in the mild range, while for day 7 there was no statistically significant difference on either sides. The swelling was statistically significant between the test and the control side at day 1 and 3, whereas there was no statistically significant difference at day 5 and 7. The discomfort was statistically significant at day 1 and 5 at the test side, while there was no discomfort at the control side.

**Conclusion**
Patients reported only mild pain locally at the spot of precision as well as mild swelling and discomfort on test side.

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**ARTICLE TITLE**: Comparison Between Integrated and Parallel Interlock Designs of an Extracoronal Attachment-retained Distal Extension Removable Partial Dentures: A Clinical Trial

**JOURNAL**: Journal of International Society of Preventive and Community Dentistry

**YEAR**: 2021

**ABSTRACT**

**Objective**
Precision attachments may exert unfavorable stresses on abutments in distal extension bases. This study compared between two reciprocation designs in attachment removable partial dentures (RPDs).

**Materials and Methods**
Fourteen patients were allocated into two groups. Each patient received an attachment-retained RPD with one of the two types of attachments being studied. Group I received the integrated interlock type of reciprocation and group II received the parallel interlock type. Abutments were examined for modified plaque index, modified bleeding index, periodontal probing pocket depth, clinical attachment level, and modified papillary bleeding Index.

**Results**
Comparisons of periodontal parameters between mesial and distal abutments within each group revealed no statistically significant difference within groups. Means of these parameters were used for the comparisons. There was a significant difference at P < 0.05 in all parameters between the two groups at time of insertion and at 3, 6, and 9 months of follow-up with values of group (II) higher than group (I).

**Conclusion**
RPDs of both designs showed an increase in periodontal parameters. Integrated interlock design showed better scores. It is preferable to use the attachment-retained RPD with integrated interlock instead of parallel interlock design.
Effect of Different Irrigation Regimens on Enterococcus faecalis Elimination from Infected Root Canals (An In-Vitro Comparative Study)  
(Joint Publication with the Faculty of Pharmacy)  

**ABSTRACT**  
Microorganisms harbored in the complexities of root canal systems might lead to endodontic failures and development of apical periodontitis. Enterococcus faecalis is the most common isolated bacteria in these cases.  

**Aim**  
This study was conducted to compare the efficiency of four irrigation regimens on the elimination of an inoculated strain of E. faecalis.  

**Materials and Methods**  
Forty single rooted extracted premolars were inoculated with a standard strain of Enterococcus faecalis (ATCC 29212) and incubated at 37˚C for two weeks to allow infection of the dentinal tubules. The bacterial suspension was replaced with a new one every 48 hours. The teeth were then divided into four groups of n=10 each, to apply irrigation regimens as follows: Group i: irrigation with normal saline, Group ii: syringe irrigation (NaOCl 2.625%), Group iii: NaOCl 2.625%+EndoActivator and Group iv: NaOCl 2.625%+diode laser. Samples were collected at baseline and after irrigation. Colony-forming unit counts were performed. For baseline count of E. faecalis, differences in means between the groups were tested using the one way ANOVA F test. For the count of E. faecalis after the irrigation, differences in means was assessed using the Kruskal Wallis test.  

**Results**  
The mean values of % of E. faecalis killed were respectively 99.2 ± 2.53% in group iv, 98.3± 5.34% in group iii, 29.0 ± 5.46% in group ii and 4.77 ± 0.78%) in group i.  

**Conclusion**  
Maximum removal of E. faecalis strains was achieved by activating 2.625% sodium hypochlorite with the diode laser.
**ARTICLE TITLE**  
Evaluation of Facial Soft-Tissue Morphology among Different Vertical Skeletal Profile

**JOURNAL**  
European Scientific Journal

**YEAR**  
2022

**PUBLICATION INFO**  
18(11): 117-134

**THEME / SUBTHEME**  
Science and Technology/ Towards Digital Dentistry

**ABSTRACT**  
The objective of this study was to compare facial groups classified according to their vertical skeletal characteristics (hypodivergent, normodivergent, and hyperdivergent) and to their respective soft tissue morphological features, particularly those relating to the lips and chin. Lateral cephalometric x-rays were collected from the Orthodontic clinic at the Faculty of Dentistry, Beirut Arab University and divided into 3 equal groups based on mandibular plane angle, hypodivergent facial type (SN/MP 37°). The mean upper and lower lips thickness was maximum among hypodivergent group (8.95 mm and 9.35 mm, respectively). The mean upper lip height was maximum among hyperdivergent group (11.3 mm), while lower lip height was maximum among hypodivergent group (25.32 mm). The mean procumbency of upper (PUL) and lower lips (PLL) was maximum among hypodivergent (2.08 mm and 0.87 mm, respectively). However, the mean chin thickness was maximum among hyperdivergent group (7.84 mm). Statistically significant difference among the three groups were observed only in Hypo vs Normo-divergent groups in ULT. Concerning PUL and PLL, there was a statistically significant differences between the different groups in Hypo vs Normodivergent and Hypo vs Hyperdivergent groups. It was concluded that the thickness of upper and lower lip, height of lower lip, and procumbency of both lips showed to be greater in hypodivergent facial patterns.

**ARTICLE TITLE**  
Evaluation of Piezotome-Corticision Assisted Orthodontics in Retracting Upper Canine: A Split Mouth Design (Randomized Clinical Trial)

**JOURNAL**  
European Scientific Journal

**YEAR**  
2021

**PUBLICATION INFO**  
17(34): 162-171

**THEME / SUBTHEME**  
Health and Wellbeing/ Oral Health Related Quality of Life

**ABSTRACT**  
The aim of this randomized clinical trial is to investigate the rate of canine retraction at different time points between piezotome-corticision assisted and conventional orthodontics.

**OBJECTIVES**  
- The objective of this study was to compare facial groups classified according to their vertical skeletal characteristics (hypodivergent, normodivergent, and hyperdivergent) and to their respective soft tissue morphological features, particularly those relating to the lips and chin. Lateral cephalometric x-rays were collected from the Orthodontic clinic at the Faculty of Dentistry, Beirut Arab University and divided into 3 equal groups based on mandibular plane angle, hypodivergent facial type (SN/MP 37°). The mean upper and lower lips thickness was maximum among hypodivergent group (8.95 mm and 9.35 mm, respectively). The mean upper lip height was maximum among hyperdivergent group (11.3 mm), while lower lip height was maximum among hypodivergent group (25.32 mm). The mean procumbency of upper (PUL) and lower lips (PLL) was maximum among hypodivergent (2.08 mm and 0.87 mm, respectively). However, the mean chin thickness was maximum among hyperdivergent group (7.84 mm). Statistically significant difference among the three groups were observed only in Hypo vs Normo-divergent groups in ULT. Concerning PUL and PLL, there was a statistically significant differences between the different groups in Hypo vs Normodivergent and Hypo vs Hyperdivergent groups. It was concluded that the thickness of upper and lower lip, height of lower lip, and procumbency of both lips showed to be greater in hypodivergent facial patterns.

**METHODS**  
- Fifteen patients were submitted for upper first premolars extraction after leveling and alignment was achieved to facilitate canine retraction. They were randomly divided into test side and control side. On the test side, the canine was retracted using piezotome-corticision assisted orthodontics, while at the control side, the canine was retracted using conventional technique. Both groups were immediately loaded with a horizontal force of 150g for canine retraction. The distance between the canine bracket hook and the first molar band hook were recorded using a digital caliper. The measurements were accomplished immediately after piezosurgery at 1, 2, 4, 8 and 12 weeks.

**RESULTS**  
- There was a statistically significant difference in the average amount of canine retraction between test and control groups (P<0.05). The canine on the test side was closed 6 weeks earlier than the control side.

**CONCLUSION**  
Piezocision is minimal invasive which accelerate the rate of canine of retraction approximately 1.5 times faster than that of conventional method.
**ARTICLE TITLE**
Evaluation of Root-End Resection With Conventional and Ultrasonic Methods: A Single-Blind, Randomized In-Vitro Study

**JOURNAL**
BAU Journal-Creative Sustainable Development

**YEAR**
2021

**PUBLICATION INFO**
3(1): 1-6

**THEME / SUBTHEME**
Creative Sustainable Development/ Sustainable Development Dentistry

**ABSTRACT**
The root-end resection is considered critical endodontic surgical procedure. Three millimeters of the root tip is resected and root-end cavity with parallel walls and comparable depth is cut to receive a root-end filling. The literature discussed dentinal cracks after root canal instrumentation and/or root dentine cutting. The aim of the present study was to assess cracks at root ends after resection with conventional versus ultrasonic techniques.

**Material and Methodology**
Thirty-two extracted human lower premolar teeth with single root were used. Their root canals were prepared and received gutta-percha. Sixteen roots Group 1 were resected using tungsten carbide fissure burs, while other sixteen teeth Group 2 were resected with ultrasonic tip, then all teeth had root end preparation with the ultrasonic coated retro trip. Both amount and categories of cracks on the resected surfaces were evaluated utilizing a dental operating microscope prior and following cavity preparation.

**Result**
Cracking was statistically significant different among the two groups after resections or after cavity preparation.

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**ARTICLE TITLE**
Prevalence of Temporomandibular Disorders Among Orthodontic Patients (Cross-Sectional Clinical Survey)

**JOURNAL**
BAU Journal-Health and Wellbeing

**YEAR**
2022

**PUBLICATION INFO**
4(2): 1-8

**THEME / SUBTHEME**
Health and Wellbeing/ Oral Health Related Quality of Life

**ABSTRACT**
Orthodontic treatment as a risk factor for the development of temporomandibular disorders (TMD) has been a controversy in literature. The aim of this study was to evaluate the prevalence of TMD, as defined in the Diagnostic Criteria (DC)/TMD Axis II, among orthodontic patients. A cross-sectional study (N=180) consisted of 3 groups: 60 control patients seeking orthodontic consultation, 60 patients undergoing orthodontic treatment for 3-5 months, 60 patients undergoing orthodontic treatment for 10-14 months. Patients answered a structured questionnaire that rated their oral parafunctions according to the Oral Behavior Checklist (OBC), pain intensity levels according to the Graded Chronic Pain Scale (GCPS), jaw functional limitations according to the Jaw Functional Limitation Scale 20 (JFLS-20), psychosocial factors (PHQ-9) and somatization levels (PHQ-15). The Chi Square test showed a statistically significant difference p-value=0.001 among both active orthodontic groups (3-5 months/10-14 months) regarding masticatory limitation (53.3%), vertical mobility limitation (41.7% for 3-5 months and 55.0% 10-14 months) and verbal & emotional expression limitation (53.3% 3-5 months and 66.7% 10-14 months). The findings revealed that as orthodontic treatment progresses, the limitation increases. Moreover, no statistical significance was observed between the three groups regarding oral parafunctional habits, chronic pain levels, psychosocial status and somatization. Orthodontic treatment is not a major factor associated with the symptoms of the TMD. Further prospective studies are needed to evaluate the true role of orthodontic treatment in the development of TMD.
**ARTICLE TITLE**  
Teaching Cariology in Asia and Arabia

**JOURNAL**  
Caries Research

**YEAR**  
2022

**PUBLICATION INFO**  
56(2): 109-115

**THEME / SUBTHEME**  
Creative Sustainable Development/ Sustainable Development Dentistry

**ABSTRACT**  
The European Organisation for Caries Research education platform 2020 had the aim to assess the undergraduate curriculum in cariology in Asian and Arabian countries in order to support structured teaching of cariology in these countries with about almost half of the global population. Representatives of 4 Asian and 4 Arabian countries completed a comprehensive questionnaire on structure of dental education in their country in general and the extent, the content, the responsibilities, structure and standardization regarding cariology in particular. In spite of a wide range from very few universities (Lebanon 3) to larger numbers of dental schools (India 313, China 121, Russia 52) there were similar statements on the list of content for cariology teaching. Often the catalogue was close to the Undergraduate Core Curriculum in Cariology (UCCC) covering most of the 5 domains from basic science to dental public health, but a national curriculum for cariology or dentistry was mostly missing. With various departments being involved, a need of coordination is obvious. Most representatives thought it possible and feasible to teach a standardized curriculum in cariology on the basis of the UCCC. In conclusion, many Arabian and Asian countries have implemented modern, evidence-based curricula in their universities, but an obligatory national curriculum in cariology would be advisable to standardize the quality in teaching.
## I. PUBLICATIONS

### ARTICLES

<table>
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<tr>
<th>ARTICLE TITLE</th>
<th>Adherence to Mediterranean Diet Among Adolescents Attending Public Schools in North Lebanon</th>
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<tr>
<td>JOURNAL</td>
<td>BAU Journal-Health and Wellbeing</td>
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<td>2021</td>
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<tr>
<td>PUBLICATION INFO</td>
<td>3(2): 1-8</td>
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<tr>
<td>THEME / SUBTHEME</td>
<td>Health and Wellbeing/ Prevention and Health Promotion</td>
</tr>
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</table>

**ABSTRACT**

The Mediterranean diet (MD) is a model of a healthy diet and healthy lifestyle. Adherence to the MD has been correlated with a reduction in many metabolic disorders including cancers. The factors associated with adolescents’ adherence to the MD in North Lebanon using the KIDMED index have never been explored. The objective of this study was to examine the factors associated with the Mediterranean diet (MD) adherence among a sample of Lebanese adolescents. A cross-sectional survey was conducted in the city of Tripoli, North Lebanon. A total of 298 students, aged 11-18 years, were randomly selected from public schools in the area. All participants completed a questionnaire on the Mediterranean diet [KIDMED index], physical activity [physical activity questionnaires for older children [PAQ-C] and adolescents [PAQ-A]], health-related quality of life [KIDSCREEN-27 index], and sociodemographic characteristics (age, gender, grade level, and parents’ educational status). The questionnaire was followed by anthropometric measurements. Adherence to the MD was good among only 13.4% of the adolescents. The prevalence rate of overweight and obesity was elevated reaching 36.9% of the students. Lower adherence to the MD was significantly correlated with skipping meals (P=0.004) and consuming fewer meals with the family.

* Names in Bold Indicate BAU Authors
**Assessment of Dietary Exposure to Ochratoxin A in Lebanese Students and Its Urinary Biomarker Analysis**

**Author(S)** Al Ayoubi M., Salman M., Gambacorta L., El Darra N., Salfrizzo M.

**ARTICLE TITLE** Assessment of Dietary Exposure to Ochratoxin A in Lebanese Students and Its Urinary Biomarker Analysis

**JOURNAL** Toxins

**YEAR** 2021

**PUBLICATION INFO** 13(11): 780-795

**THEME / SUBTHEME** Health and Wellbeing/ Illness and Therapy

**ABSTRACT** The present study investigated the dietary and urinary OTA occurrence among 44 Lebanese children. Relying on HPLC-FLD analysis, OTA was found in all the urine samples and in 46.5% and 25% of the 24 h duplicate diet and dinner samples, respectively. The means of OTA levels in positive samples were 0.32 ± 0.1 ng/g in 24 h diet, 0.32 ± 0.18 ng/g in dinner and 0.022 ± 0.012 ng/mL in urines. These values corresponded to margin of exposure (MOE) means of 7907 ± 5922 (neoplastic) and 2579 ± 1932 (non-neoplastic) calculated from positive 24 h diet, while 961 ± 599 (neoplastic) and 313 ± 195 (non-neoplastic) calculated from the urine. Since the MOE levels for the neoplastic effect were below the limit (10,000), a major health threat was detected and must be addressed as a health institutions’ priority. Besides, the wide difference between PDIs and MOEs calculated from food and urine suggests conducting further OTA’s toxicokinetics studies before using urine to measure OTA exposure.

**Association of Inherited Thrombophilia with Recurrent Pregnancy Loss in A Population of Lebanese Women: A Case Control Study**

**Author(S)** Khalife S., Geitani R.

**ARTICLE TITLE** Association of Inherited Thrombophilia with Recurrent Pregnancy Loss in A Population of Lebanese Women: A Case Control Study

**JOURNAL** International Journal of Fertility and Sterility

**YEAR** 2022

**PUBLICATION INFO** 16(3): 247-251

**THEME / SUBTHEME** Health and Wellbeing/ Prevention and Health Promotion

**ABSTRACT** Recurrent pregnancy loss [RPL] complication is a challenge of reproductive medicine due to its often unknown etiology. A case-control study was carried out between June 2019 and April 2020 to examine the correlation between RPL and inherited thrombophilia [IT], namely mutations in factor V Leiden (FVL G1691A), prothrombin [FII G20210A], and methylenetetrahydrofolate reductase [MTHFR C677T]. A total of 120 Lebanese women with RPL was studied and compared, for the frequency of these mutations, to 100 healthy reproductive Lebanese women. The association between the zygosity status of the three tested mutations, the existence of more than one prothrombotic single nucleotide polymorphisms (SNPs), and the increased risk of RPL were examined using Chi-square or two-tailed fisher exact test, and the student t test. The predictive factors of RPL were analyzed using a multiple logistic regression model. P < 0.05 was considered to be statistically significant. Our results showed statistically significant higher frequencies of FVL G1691A and FII G20210A mutations among the cases with RPL compared to the control group. Thus, RPL is associated with FVL G1691A and FII G20210A mutations. These mutations seem to increase the risk of RPL in the Lebanese women.
**Can Intentional Weight Loss Ameliorate Sarcopenia in Individuals with Obesity? A Longitudinal Interventional Study**

*Tannir H., Itani L., Kreidieh D., El Masri D., El Ghoch M.*

**ARTICLE TITLE**

Journals and Practice

**YEAR**

2022

**PUBLICATION INFO**

12[1]: 106-112

**THEME / SUBTHEME**

Health and Wellbeing/ Prevention and Health Promotion

**ABSTRACT**

Little remains known regarding the impact of weight loss on sarcopenia obesity (SO), and for this reason we aimed to assess the relationship between the two during a weight management program. Body composition was measured at baseline and six-month follow-up using the Tanita BC-418, and step measurements were obtained daily over a period of six months using an Omron HJ-320 pedometer, in 41 adults of both genders with obesity. The participants were then categorized according to the presence or absence of SO. After a significant weight loss, an improvement in the appendicular skeletal mass (ASM) to weight ratio (24.5 ± 3.5 vs. 26.2 ± 3.6, \( p < 0.01 \)), indicated a decrease in the prevalence of SO by 12.2%. Moreover, these findings were confirmed by logistic regression analysis revealing a significant WL% \( \geq 5\% \) combined with an active lifestyle (i.e., \( \geq 8000 \) steps/day), decreased the risk of SO by 91% (OR = 0.09; 95% CI: 0.02–0.56), after adjusting for age and gender. In conclusion, in a weight management setting, a personalized program for individuals with SO that incorporates new strategies in terms of weight loss and physical activity targets may be adopted to improve the sarcopenia-related index and reduce the prevalence of SO in this population.

**Clinical and Nutritional Management of Very-Low-Calorie Ketogenic Diet (VLCKD) in Patients with Psoriasis and Obesity: A Practical Guide for the Nutritionist**

*Barreaa L., Caprio M., Camajani E., Verde L., Elce A., Frias-Toral E., Ceriani F., Cucalón G., Garcia-Velasquez E., El Ghoch M., Colao A., Savastano S., Muscogiuri G.*

**ARTICLE TITLE**

Critical Reviews in Food Science and Nutrition

**YEAR**

2022

**PUBLICATION INFO**

DOI: 10.1080/10408398.2022.2083070

**THEME / SUBTHEME**

Health and Wellbeing/ Prevention and Health Promotion

**ABSTRACT**

Psoriasis is an immune-mediated inflammatory skin disease associated with multiple comorbidities. Considered one of the most common inflammatory skin diseases among the general population, it not only affects the skin, but also negatively impacts other organs and joints. In addition, psoriasis has been associated with several chronic cardiometabolic diseases such as obesity, which would seem to be (i) a risk factor for the onset of psoriasis and (ii) a worsening factor of the severity of the disease. Weight loss appears to improve severity in overweight patients. Recently proposed as an obesity management nutritional strategy, the very-low-calorie ketogenic diet (VLCKD) has demonstrated significant effects in reducing inflammatory processes. In the current review, we describe the evidence available on psoriasis and VLCKD, and provide a practical guide to the prescription of VLCKD in the different phases, evaluation and management of possible adverse events, and the importance of physical activity as a lifestyle modification to reduce psoriasis and associated comorbidities. Randomized control trials are, however, necessary to determine the most effective VLCKD protocol for patients with obesity and psoriasis, optimal protocol duration, composition of micronutrients and macronutrients, choice of special supplements, and management of carbohydrate reintroduction.
### Clinical Update on the Use of Mesenchymal Stem Cells in COVID-19

**Author(S):** Saleh F., Ghazzawi J.

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<tr>
<th>ARTICLE TITLE</th>
<th>Clinical Update on the Use of Mesenchymal Stem Cells in COVID-19</th>
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<td>JOURNAL</td>
<td>American Journal of Translational Research</td>
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<td>Health and Wellbeing/ Illness and Therapy</td>
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**ABSTRACT**

The COVID-19 pandemic has evoked the scientific community to combine all efforts needed to find a cure for the disease. With the limited therapeutic effects of pharmacological therapies, attention has been drawn to alternative ones such as stem-cell based therapy particularly with mesenchymal stem cells (MSCs). Recently, a large number of clinical trials are ongoing to evaluate the safety and efficacy of MSCs in patients with COVID-19 patients, especially the critically ill. Herein, we shed light on the therapeutic agents that have been tested and used for the treatment of COVID-19 and provide an insight into MSC-based approaches for COVID-19 at both preclinical and clinical levels.

### COVID-19 in Lebanon: Demographics and Distribution

**Author(S):** Fadlallah M., Hobeiche F., Jamal M., Sokhn E.

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<th>ARTICLE TITLE</th>
<th>COVID-19 in Lebanon: Demographics and Distribution</th>
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**ABSTRACT**

COVID-19 pandemic has emerged over more than 200 countries leading to more than 117 million infection cases and more than 2.6 million deaths. Lebanon is one of the countries affected by this disease especially in the second half of 2020 reaching its peak early this year. In this study, we studied the impact of multiple factors on this surge and analyzed the positive tests among different age groups over a period of one year (from March 2020 to February 2021). Data was collected from one medical center in Beirut where more than 20,000 PCR tests were done using RT-PCR method between March 2020 and February 2021 and analyzed the pattern of increase of the rate of positivity over this period. The SARS-CoV-2 positivity rate was 13% over a period of one year. The highest number of positive PCR tests was in patients aged between 20 and 39 years. Furthermore, the number of positive tests was low in the first 4 months, which was followed by a dramatic increase in July 2020 reaching a peak in January 2021. Lebanon is among the countries affected lately by the COVID-19 pandemic with most cases arising after August 2020 affected by the blast of Beirut and emergence of new variants resulting in higher positivity rate. Moreover, our data shows a distribution of age similar to other countries and suggest its role in the rapid increase of positivity rate.

### Do Lifestyle Interventions before Gastric Bypass Prevent Weight Regain after Surgery? A Five-Year Longitudinal Study

**Author(S):** Vaccaro S., Itani L., Scazzina F., Bonilauri S., Cartelli C., El Ghoch M., Pellegrini M.

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<th>ARTICLE TITLE</th>
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<td>Health and Wellbeing/ Prevention and Health Promotion</td>
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**ABSTRACT**

It is unclear whether weight loss (WL) achieved by means of lifestyle interventions (LSIs) before bariatric surgery (BS) can improve long-term WL outcomes after surgery. We aimed to assess the impact of a structured LSI on WL% after gastric bypass (GBP). Two groups of patients were selected from a large cohort of participants with obesity who underwent GBP surgery at Santa Maria Nuova Hospital (Reggio Emilia, Italy). The groups were categorized as those who have or have not received LSI prior to GBP. The LSI group included 91 participants [cases] compared to 123 participants [controls] in the non-LSI group. WL% was measured at follow-up times of 1, 3, 6, 12, 24, 36, 48, and 60 months. The LSI group achieved a clinically significant WL% 1-7.5% before BS, and at the time of surgery, the two groups had similar body weights and demographic statuses. At all points, until the 24-month follow-up, the two groups displayed similar WLs%. With regard to the longer follow-ups, the LSI group maintained weight loss until the last timepoint (60 months), whereas the non-LSI group experienced weight regain at 36, 48, and 60 months. In a real-world context, a structured behavioral LSI prior to GBP seems to prevent longer-term weight regain.
Editorial: Nutrition and Health-Related Quality of Life: Is It an Ignored Outcome?
Frontiers in Nutrition
2021
DOI: 10.3389/fnut.2021.778816
Health and Wellbeing/ Prevention and Health Promotion

In the last three decades, the dimension “health-related quality of life (HRQoL)” has gained attention to an extent to be considered an important clinical outcome, which reflects the patients’ subjective experiences, perceptions and judgments related to their overall wellbeing in relation to diseases as well as treatment. HRQoL is a multidimensional concept of wellbeing encompassing physical and occupational function, psychological state, social interaction, somatic sensation, overall life satisfaction and perceptions of health status. Several questionnaires have been developed and tested, showing validity and reliability in the assessment of HRQoL in different clinical settings and across different populations. Despite this, there is still a lack of a comprehensive understanding of HRQoL and its relationship with dietary patterns, nutrition and food literacy and nutrition-related non-communicable diseases (e.g., obesity, type 2 diabetes, cardiovascular disease).

Effect of Adding Motorized Cycle Ergometer Over Exercise Training on Balance in Older Adults with Dementia: A Randomized Controlled Trial
Experimental Aging Research
2022
DOI: 10.1080/0361073X.2022.2046947
Health and Wellbeing/ Illness and Therapy

Falls secondary to balance disturbances have been considered as a burden on health systems in people with dementia aged above 65. Exercise has been increasingly recommended to address such problem and the main challenges being the commitment and supervision of training. The study’s aim was to investigate the effect of adding motorized cycle ergometer (MCE) on high intensity functional exercise (HIFE) training on balance and cognition in older adults with dementia.

Methods
Sixty participants over the age of 65 were randomly allocated into 3 groups, Mo, Ex, and MoEx undergoing, respectively, 50 minutes MCE, HIFE, or combination of both. Sessions were done 3 times per week for 12 weeks. Outcome measures taken before and after study period were Berg Balance Scale (BBS), timed up and go test (TUG), and Mini Mental State Exam (MMSE).

Results
All groups showed significant improvement in BBS scores but not on TUG or MMSE scores. Between group analysis showed no privilege of any used training methods over the other for all measures taken.

Conclusions
Training with HIFE, MCE, or combination of both is effective in improving balance but not cognition. However, MCE can be an alternative to supervised exercise training in addressing balance.

Effect of Adipose Derived Mesenchymal Stem Cells on Multiple Organ Injuries in Diet-Induced Obese Mice
Tissue Barriers
2021
9(4): 21-29
Health and Wellbeing/ Illness and Therapy

Obesity is a complex disease involving the accumulation of body fat that can inflict a substantial risk to health due to the potent role it plays in the development of a series of chronic diseases including cardiovascular diseases (CVD), nonalcoholic fatty liver diseases (NAFLD), kidney diseases, diabetes, and some cancers. Despite all efforts made, no therapy has succeeded in reversing the obesity pandemic and its associated diseases.
Factors Associated with Oral Health-Related Quality of Life Among Lebanese Community-Dwelling Elderly

Objective
The purpose of this cross-sectional study was to investigate the association between sociodemographic factors, health-related characteristics, functional status and oral health-related quality of life (OHRQoL) among a representative sample of the community-dwelling Lebanese elderly.

Methods
The study sample included 905 randomly selected community-dwelling elderly Lebanese aged 65 or older living in Greater Beirut. The sample was selected through multi-stage cluster sampling. Participants completed a comprehensive multi-component questionnaire, administered by trained interviewers, including sociodemographic factors, health characteristics, eating behaviours and functional characteristics. OHRQoL was assessed through the Geriatric Oral Health Assessment Index (GOHAI) questionnaire.

Results
Among the participants, 51.6% reported poor OHRQoL. The following variables were significantly associated with poor OHRQoL: lack of health insurance (OR = 1.72, 95% CI: 1.05-2.81); poor or average self-rated general health (OR = 2.58, 95% CI: 1.23-5.41 and OR = 2.27, 95% CI: 1.24-4.16, respectively); monotony of diet (OR = 1.69, 95% CI: 1.02-2.71); absence of dentures (OR = 13.78, 95% CI: 5.02-37.84); insufficient dentures (OR = 18.19, 95% CI: 4.43-74.68); presence of dentures (OR = 2.18, 95% CI: 1.16-4.09); and depression (OR = 2.21, 95% CI: 1.26-3.89).

Conclusion
The present study revealed that a lack of health insurance, negative perception of general health, monotony of diet, denture use and depression were significantly correlated with poor OHRQoL among community-dwelling Lebanese elderly.

Follow Up From the Lebanese Heart Failure Snapshot: Reflection of Geopolitical Instability

Background
Heart failure has a great cost on the health care system. The readmission and mortality rates and their predictors are greatly affected by political and sociocultural unrests.

Aims
To determine the readmission and mortality rates and their predictors in heart failure population in times of political and sociocultural unrests.

Design
A cross-sectional follow-up with patients recruited for the Lebanese Heart Failure Snapshot was conducted over the month of June in 2019.

Methods
Phone calls were conducted at 30-90 days, 6-12 months following hospital discharge for patient previously admitted to one of the study hospitals for heart failure exacerbation. Follow-up data was conducted from July 2019 till May 2020.
From the Ketogenic Diet to the Mediterranean Diet: The Potential Dietary Therapy in Patients with Obesity after COVID-19 Infection (Post COVID Syndrome)

**ARTICLE TITLE**
Current Obesity Reports

**JOURNAL**
Frontiers in Genetics

**YEAR**
2022

**PUBLICATION INFO**
DOI: 10.3389/fgene.2022.914345

**THEME / SUBTHEME**
Health and Wellbeing/ Illness and Therapy

**ABSTRACT**

**Purpose of Review**
This review primarily examines the evidence for areas of consensus and on-going uncertainty or controversy about diet and physical exercise approaches for in the post-CoVID. We propose an ideal dietary and physical activity approach that the patient with obesity should follow after CoVID-19 infection in order to reduce the clinical conditions associated with post-CoVID syndrome.

**Recent Findings**
The CoVID-19 disease pandemic, caused by the severe acute respiratory syndrome coronavirus-2, has spread all over the globe, infecting hundreds of millions of individuals and causing millions of death. It is also known to be is associated with several medical and psychological complications, especially in patients with obesity and weight-related disorders who in general pose a significant global public health problem, and in specific affected individuals are on a greater risk of developing poorer CoVID-19 clinical outcomes and experience a higher rate of mortality. Little is still known about the best nutritional approach to be adopted in this disease especially in the patients post-CoVID syndrome.

**Summary**
To the best of our knowledge, no specific nutritional recommendations exist to manage in the patients post-CoVID syndrome. We report a presentation of nutritional therapeutic approach based on a ketogenic diet protocol followed by a transition to the Mediterranean diet in patients post-infection by CoVID, combined to a physical activity program to address conditions associated with post-CoVID syndrome.

**Author(S)**
ARTICLE TITLE: Knowledge, Attitude and Practice Towards Antibiotic Use Among Lebanese Health Professions Students: A Multicentre Cross-Sectional Study (Joint Publication with the Faculty of Science)

JOURNAL: BAU Journal-Health and Wellbeing

YEAR: 2021


THEME / SUBTHEME: Health and Wellbeing/ Prevention and Health Promotion

ABSTRACT: Antibiotic resistance poses a great threat to the public health at a global scale. This resistance has emerged due to the misuse and overuse of antibiotics, especially in countries where antibiotics are dispensed without a prescription. The aim of this study was to evaluate knowledge, behavior and practice towards antibiotics among medical students in universities. The study is a cross sectional survey using questionnaire. Data were collected from a random sample of 226 students of two faculties pharmacy and health sciences. Results showed good knowledge of participants since 87.6% had more than 50% correct answers. 47% of physicians prescribe antibiotics to treat common cold and 46% of physicians prescribe antibiotics over the phone without examining the patient. Awareness campaigns should be launched among the general public as well as healthcare professionals aiming at raising awareness regarding antibiotic misuse and resistance.

Author(s): Damer R., Kojok H., El Darra N., Saleh F.
**Article 1:**

**ARTICLE TITLE**

Molecular Identification and Azole Susceptibility Testing of Aspergillus Section Fumigati Isolated from Soil Samples in Lebanon

**JOURNAL**

Journal de Mycologie Medicale

**YEAR**

2021

**PUBLICATION INFO**

DOI: 10.1016/j.mycmed.2021.101242

**THEME / SUBTHEME**

Health and Wellbeing/ Prevention and Health Promotion

**ABSTRACT**

Aspergillus fumigatus is a human pathogen and a widespread fungus in the environment. This fungus produces airborne spores, which are inhaled by humans, and can cause a range of diseases including allergic syndromes, chronic pulmonary infections or acute invasive infections in immunocompromised patients [1]. A limited number of antifungal drugs are available for treatment, such as azoles which are generally effective and considered as the first line drugs used in the prophylaxis and treatment of Aspergillus diseases [2]. However, azole-resistance has been recorded worldwide, threatening current treatment options [3]. Azole-resistance can develop in A. fumigatus sensu stricto either through azole exposure during therapy or in the environment, after exposure to azole fungicides, and has been reported in clinical and environmental samples in many countries with varying prevalences [4]. In the Middle Eastern countries, A. fumigatus azole-resistant strains have been reported in Turkey [5], Iran [6], and Kuwait [7]. In Lebanon, a recent study has examined 73 Aspergillus isolates recovered mostly from patients with ear infections. The predominant species was A. niger (54.8%), followed by A. flavus (27.4%), and A. tubingensis (5.4%), whereas A. fumigatus represented only 4.1% of the isolates. Susceptibility testing revealed an overall high frequency of antifungal resistance. Two A. fumigatus isolates presented elevated azole minimal inhibitory concentration values (MICs), but underlying mechanisms were not explored [8]. Therefore, data regarding A. fumigatus azole-resistance in clinical samples remains limited in Lebanon, and the occurrence of resistance remains unknown in the environment.

In this study, we sought to assess the prevalence and mechanisms of Aspergillus section Fumigati azole-resistance in environmental samples in North Lebanon through collection of soil samples from selected areas.

**Author(S)**

Khalife S., Resendiz-Sharpe A., Lagrou K., Fréalle E.

**Article 2:**

**ARTICLE TITLE**

Novel Missense and Splice Site Mutations in USH2A, CDH23, PCDH15, and ADGRV1 Are Associated With Usher Syndrome in Lebanon

**JOURNAL**

Frontiers in Genetics

**YEAR**

2022

**PUBLICATION INFO**

DOI: 10.3389/fgene.2022.864228

**THEME / SUBTHEME**

Health and Wellbeing/ Illness and Therapy

**ABSTRACT**

The purpose of this study was to expand the mutation spectrum by searching the causative mutations in nine Lebanese families with Usher syndrome (USH) using whole-exome sequencing. The pathogenicity of candidate mutations was first evaluated according to their frequency, conservation, and in silico prediction tools. Then, it was confirmed via Sanger sequencing, followed by segregation analysis. Finally, a meta-analysis was conducted to calculate the prevalence of USH genes in the Lebanese population. Three missense mutations, two splice site mutations, and one insertion/deletion were detected in eight of the families. Four of these variants were novel: c.5535C>T; p.(Asn1845Lys) in exon 41 of CDH23, c.7130G>A; p.(Arg2377Gln) in exon 32 of ADGRV1, c.11390-1G>A in USH2A, and c.3999-6A>G in PCDH15. All the identified mutations were shown to be likely disease-causing through our bioinformatics analysis and co-segregated with the USH phenotype. The mutations were classified according to the ACMG standards.

Finally, our meta-analysis showed that the mutations in ADGRV1, USH2A, and CLRN1 are the most prevalent and responsible for approximately 75% of USH cases in Lebanon. Of note, the frequency USH type 3 showed a relatively high incidence (23%) compared to the worldwide prevalence, which is around 2-4%. In conclusion, our study has broadened the mutational spectrum of USH and showed a high heterogeneity of this disease in the Lebanese population.

**Author(S)**

Jaffal L., Akhdar H., Joumaa H., Ibrahim M., Chhour Z., Assi A., Helou C., Lee H., Seo B., Joumaa W., El Shamieh S.
**Nutritional Management of Type 2 Diabetes in Subjects with Obesity: An International Guideline for Clinical Practice**

**Critical Reviews in Food Science and Nutrition**

**2021**

**DOI:** 10.1080/10408398.2021.1980766

**Health and Wellbeing/Prevention and Health Promotion**

Type 2 diabetes mellitus (T2DM) and obesity represent a global public health problem. Current nutritional recommendations focused on weight loss and overall dietary quality. However, there is no consensus on the optimal macronutrient composition of the diet, particularly for the long-term management of T2DM in subjects with obesity. An international panel of experts reviewed and critically appraised the updated literature published on the topic. This review primarily examines the evidence for areas of consensus and uncertainty about nutritional therapy in patients with T2DM and obesity. The aim of this article is to provide nutritional advice to manage these patients in clinical practice.

**Oxidative Stress Response Pathways in Fungi**

**Cellular and Molecular Life Sciences**

**2022**

**DOI:** 10.1007/s00018-022-04353-8

**Health and Wellbeing/Illness and Therapy**

Fungal response to any stress is intricate, specific, and multilayered, though it employs only a few evolutionarily conserved regulators. This comes with the assumption that one regulator operates more than one stress-specific response. Although the assumption holds true, the current understanding of molecular mechanisms that drive response specificity and adequacy remains rudimentary. Deciphering the response of fungi to oxidative stress may help fill those knowledge gaps since it is one of the most encountered stress types in any kind of fungal niche. Data have been accumulating on the roles of the HOG pathway and Yap1- and Skn7-related pathways in mounting distinct and robust responses in fungi upon exposure to oxidative stress. Herein, we review recent and most relevant studies reporting the contribution of each of these pathways in response to oxidative stress in pathogenic and opportunistic fungi after giving a parallelized overview in two divergent models, the budding and fission yeasts. With the concept of stress-specific response and the importance of reactive oxygen species in fungal development, we first present a preface on the expanding domain of redox biology and oxidative stress.

**Post Stroke Fatigue Prevalence and its Correlation to the Functional Recovery**

**Clinical Schizophrenia and Related Psychoses**

**2022**

**DOI:** 10.3371/CSRP.AADF.021822

**Health and Wellbeing/Illness and Therapy**

Post Stroke Fatigue (PSF) is an irritating symptom in chronic stroke survivors. They report that the symptoms of the PSF are greater after their stroke’s incidence which might affect the rehabilitation process. PSF could limit the active participation of the patient in the environment as well as in different functional tasks of daily living activities.

**Purpose**

To determine the PSF prevalence in chronic stroke patients and to investigate its correlation on their functional recovery.
ARTICLE TITLE
Predictive Equations Based on Body Composition for Resting Energy Expenditure Estimation in Adults with Obesity

JOURNAL
Current Diabetes Reviews

YEAR
2020

PUBLICATION INFO
16(4): 381-386

THEME / SUBTHEME
Health and Wellbeing/ Prevention and Health Promotion

ABSTRACT
Background and Aim
An accurate estimation of Resting Energy Expenditure (REE) in patients with obesity is crucial. Therefore, our aim was to assess the validity of REE predictive equations based on body composition variables in treatment-seeking Arab adults with obesity.

Author(S)
El Masri D., Itani L., Kreidieh D., Tannir H., El Ghoch M.

ARTICLE TITLE
Risk Assessment of Pesticide Residues from Foods of Plant Origin in Lebanon

JOURNAL
Food Chemistry

YEAR
2022

PUBLICATION INFO
DOI: 10.1016/j.foodchem.2021.131676

THEME / SUBTHEME
Health and Wellbeing/ Illness and Therapy

ABSTRACT
Methods
Body composition and REE were measured by Tanita BC-418 bioimpedance and Vmax Encore 229 IC, respectively, and predictive equations based on fat mass and fat-free mass were used in REE estimations among 87 adults of both genders, in the Outpatient Clinic in the Department of Nutrition and Dietetics at Beirut Arab University (Lebanon). The mean differences between the measured and estimated REE values were calculated to assess the accuracy, and the Bland-Altman method was used to assess the level of agreement.

Results
Ten predictive equations were included. In males, all the predictive equations gave significantly different estimates of REE when compared to that measured by IC. On the other hand, in females, the mean difference between the REE value estimated by Huang and Horie-Waitzberg equations and that measured using IC was not significant, and the agreement was confirmed using Bland-Altman plots.

Conclusion
Huang and Horie-Waitzberg equations are suggested for accurate REE estimation in females; however, new validated REE estimation equations for males in this population are still needed.

Author(S)
Khazaal S., El Darra N., Kobeissi A., Jammoul R., Jammoul A.
<table>
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<tr>
<th>Author(s)</th>
<th>Chedid P., Salami A., Ibrahim M., Visvikis-Siest S., El Shamieh S.</th>
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<td>ARTICLE TITLE</td>
<td>The Association of Vascular Endothelial Growth Factor Related SNPs and Circulating Iron Levels Might Depend on Body Mass Index</td>
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<tr>
<td>JOURNAL</td>
<td>Frontiers in Bioscience – Landmark</td>
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<td>Health and Wellbeing/Illness and Therapy</td>
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Vascular Endothelial Growth Factor (VEGF) is an essential regulator of vascular biology. In addition to the well-established role in angiogenesis, circulating VEGF levels were found elevated in severely anemic patients, pointing out that anemia might affect the progression of angiogenesis in malignant and benign diseases through the alteration of VEGF levels. Ten single nucleotide polymorphisms (SNPs) in VEGFA and other loci were shown to explain more than 50% of its circulating levels. This study investigated the association of those ten VEGF-related SNPs with serum iron levels in a general Lebanese population free of chronic diseases (N = 460).

Result
We found that the rs10738760 and the body mass index (BMI) were associated with decreased iron levels (p = 0.002, and p < 0.001, respectively). When taken together, both variables, rs10738760 and BMI, interacted to reduce iron levels (p < 0.001). According to obesity status, the stratification revealed that the effect of rs10738760 was more pronounced in obese than non-obese individuals (p = 0.025). Conclusion: The intergenic SNP rs10738760 is associated with circulating iron levels, and this association depends on BMI status. Although of interest, these results need replication in larger populations from different ancestries. |

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<th>Author(s)</th>
<th>Fawaz M., Itani M.</th>
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<td>ARTICLE TITLE</td>
<td>The Psychological Experiences of Lebanese Ground Zero Front-Line Nurses During the Most Recent COVID-19 Outbreak Post Beirut Blast: A Qualitative Study</td>
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<td>JOURNAL</td>
<td>International Journal of Social Psychiatry</td>
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<td>YEAR</td>
<td>2021</td>
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<tr>
<td>PUBLICATION INFO</td>
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<td>THEME / SUBTHEME</td>
<td>Health and Wellbeing/Prevention and Health Promotion</td>
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<td>ABSTRACT</td>
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Background
For the past 2 months the number of COVID-19 cases in Lebanon has been on the rise, while frontline nurses after the Beirut Blast of August 4th have been practicing through limited resources and a challenging context.

Aim
This paper aims at exploring the psychological experiences of Lebanese frontline nurses serving at ground zero hospital during the current COVID-19 outbreak.

Setting
This study was carried out in three main ground-zero hospitals in Beirut which are receiving COVID-19 cases.

Method
This study have employed a phenomenological exploratory qualitative research design, where virtual interviews were conducted with 18 frontline nurses during the second week of January 2021.

Results
Thematic analysis of the data expressed by the frontline nurses working in the approached ground-zero hospitals gave rise to five themes, namely, helplessness and impending doom, increased mortality rates and depressive mood, fear of death and obsessive thinking, flashbacks, panic, and incompetence, and public recklessness, governmental responsibility, and anger.

Conclusion
The frontline nurses working at ground zero hospitals in Beirut are facing significant psychological challenges that should be mediated by the government and health policymakers in order to safeguard the quality of care and avoid higher mortality rates. |
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<th>ARTICLE TITLE</th>
<th>The Research Output of Rod-Cone Dystrophy Genetics</th>
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<td>JOURNAL</td>
<td>Orphanet Journal of Rare Diseases</td>
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<tr>
<td>ABSTRACT</td>
<td>Non-syndromic rod-cone dystrophy (RCD) is the most common condition in inherited retinal diseases. The aim of this study was to evaluate the research output and productivity related to RCD genetics per countries as classified by the human development index (HDI), by analyzing publication frequency and citations, the choice of journals and publishers, since 2000 to date. We have also analyzed the use of next-generation sequencing (NGS) in publications originating from countries with different HDIs. One thousand four hundred articles focusing on non-syndromic RCD were downloaded and analyzed. Citations and published articles were adjusted per one million individuals. The research output is significantly higher in very high HDI countries (86% of the total publications and 95% of the citations) than countries with lower HDIs in all aspects. High and medium HDI countries published together 13.6% of the total articles worldwide and received 4.6% of the citations. On the publication level, the USA (26%), United Kingdom (16%), and Japan (7%) were the top 3 among very high HDI countries, while China (6%) and India (2%) ranked first in high and medium HDI countries respectively. On the citation level, similar profiles were found. Following adjustment for population size, Switzerland (~14%), Jordan (~1%) and Morocco (&lt;0.2%) showed the highest rates of publications in very high, high and medium HDI countries respectively. Very high HDI countries published 71% of their papers in first quartile journals (first quartile in Scimago journal rank; Q1), and 23% in Q2 journals. High and medium HDI countries showed a similar profile in quartiles with ~ 40% of their papers published in Q1 journals and ~30% in Q2 journals. The first publication using NGS was issued in 2009 in very high HDI countries, while it appeared in 2012 in high HDI countries, and in 2017 in medium HDI countries, with a respective lag of 3 to 8 years compared to very high HDI countries. A profound gap exists between very high HDI countries and the rest of the world. To fill it in, we propose implementing NGS, supporting international collaborations, building capacities and infrastructures, improving accessibility of patients to services, and increasing national and international funding.</td>
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<th>ARTICLE TITLE</th>
<th>The Role of Obesity, Body Composition, and Nutrition in COVID-19 Pandemia: A Narrative Review</th>
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<td>JOURNAL</td>
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<td>THEME / SUBTHEME</td>
<td>Health and Wellbeing/ Prevention and Health Promotion</td>
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<tr>
<td>ABSTRACT</td>
<td>The coronavirus disease 2019 (COVID-19) pandemic has spread worldwide, infecting nearly 500 million people, with more than 6 million deaths recorded globally. Obesity leads people to be more vulnerable, developing worse outcomes that can require hospitalization in intensive care units (ICU). This review focused on the available findings that investigated the link between COVID-19, body composition, and nutritional status. Most studies showed that not only body fat quantity but also its distribution seems to play a crucial role in COVID-19 severity. Compared to the body mass index (BMI), visceral adipose tissue and intraabdominal fat are better predictors of COVID-19 severity and indicate the need for hospitalization in ICU and invasive mechanical ventilation. High volumes of epicardial adipose tissue and its thickness can cause an infection located in the myocardial tissue, thereby enhancing severe COVID-related myocardial damage with impairments in coronary flow reserve and thromboembolism. Other important components such as sarcopenia and intermuscular fat augment the vulnerability in contracting COVID-19 and increase mortality, inflammation, and muscle damage. Malnutrition is prevalent in this population, but a lack of knowledge remains regarding the beneficial effects aimed at optimizing nutritional status to limit catabolism and preserve muscle mass. Finally, with the increase in patients recovering from COVID-19, evaluation and treatment in those with Long COVID syndrome may become highly relevant.</td>
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Three-Dimensional Cell Culture Models to Study Respiratory Virus Infections Including COVID-19

Author(S)  Harb A., Fakhreddine M., Zaraket H., Saleh F.

ARTICLE TITLE  Three-Dimensional Cell Culture Models to Study Respiratory Virus Infections Including COVID-19

JOURNAL  Biomimetics

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THEME / SUBTHEME  Health and Wellbeing/ Illness and Therapy

ABSTRACT  Respiratory viral infections, including severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), are among the most common illnesses and a leading cause of morbidity and mortality worldwide. Due to the severe effects on health, the need of new tools to study the pathogenesis of respiratory viruses as well as to test for new antiviral drugs and vaccines is urgent. In vitro culture model systems, such as three-dimensional (3D) cultures, are emerging as a desirable approach to understand the virus host interactions and to identify novel therapeutic agents. In the first part of the article, we address the various scaffold-free and scaffold-based 3D culture models such as hydrogels, bioreactors, spheroids and 3D bioprinting as well as present their properties and advantages over conventional 2D methods. Then, we review the 3D models that have been used to study the most common respiratory viruses including influenza, parainfluenza, respiratory syncytial virus (RSV) and coronaviruses. Herein, we also explain how 3D models have been applied to understand the novel SARS-CoV-2 infectivity and to develop potential therapies.

Vitamin D Related Gene Polymorphisms and Cholesterol Levels in a Mediterranean Population

Author(S)  Fakhoury H., El Shamieh S., Rifai A., Tamim H., Fakhoury R.

ARTICLE TITLE  Vitamin D Related Gene Polymorphisms and Cholesterol Levels in a Mediterranean Population

JOURNAL  Journal of Cardiovascular Development and Disease

YEAR  2022

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THEME / SUBTHEME  Health and Wellbeing/ Illness and Therapy

ABSTRACT  In addition to its role in bone health, vitamin D (VitD) has been implicated in several pathological conditions. Specifically, VitD deficiency has been linked to an increased risk of dyslipidemia. Atherogenic dyslipidemia is characterized by increased low-density lipoprotein-cholesterol (LDL-C) and decreased high-density lipoprotein-cholesterol (HDL-C). In this study, we examined the association of six single nucleotide polymorphisms (SNPs) in VitD-related genes with VitD and lipid levels, in a cohort of 440 Lebanese participants free from chronic diseases. Our results showed no association of the examined SNPs with VitD concentrations. However, the presence of the minor allele in rs10741657G>A of CYP2R1 was associated with increased levels in LDL-C ($\beta = 4.95$, $p = 0.041$) and decreased levels in HDL-C ($\beta = -1.76$, $p = 0.007$). Interestingly, rs10741657G>A interacted with gender to increase LDL-C levels in females ($\beta = 6.73$ and $p = 0.03$) and decrease HDL-C levels in males HDL-C ($\beta = -1.09$, $p = 0.009$). In conclusion, our results suggest that rs10741657 G>A in CYP2R1 is associated with circulating LDL-C and HDL-C levels in a Lebanese cohort. Although this association was gender-specific, where rs10741657G>A was associated with increased LDL in females and decreased HDL in males, the presence of the minor allele A was associated with increased cardiovascular risk in both genders. These findings need to be validated in a larger population. Further investigations are warranted to elucidate the molecular mechanism of VitD polymorphism and dyslipidemia.

Why Should Sarcopenic Obesity be Included in a Routine Assessment During Weight-Management Programmes?

Author(S)  El Ghoch M., Pellegrini M.

ARTICLE TITLE  Why Should Sarcopenic Obesity be Included in a Routine Assessment During Weight-Management Programmes?

JOURNAL  Frontiers in Endocrinology

YEAR  2022

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THEME / SUBTHEME  Health and Wellbeing/ Prevention and Health Promotion

ABSTRACT  Sarcopenic obesity (SO) is a phenotype that gained interest in the past two decades. It combines an increase in fat deposition with a reduction of muscle mass and strength. Till now SO is not included among routine assessment in weight-management setting for obesity. In this opinion paper we aim to explain the rational behind the clinical implication of the inclusion of screening for SO at baseline obesity treatments. First of all, SO is a prevalent condition in weight-loss settings; in addition to that, it is strongly associated with weight-related diseases and comorbidities. Moreover baseline SO is associated with poorer physical fitness, reduced resting energy expenditure and more sedentary lifestyle. Finally, it predicts poorer clinical outcomes of obesity treatment such as the early dropout and the lack of weight-loss maintenance in the long term. In here stems the clinical implication to include the screening of SO as a routine assessment at baseline in patients with obesity willing to start weight management programs.