

# Systematic Reviews in Pharmacy

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- **The Effect of Double Role Conflict (Work Family Conflict) on Female Worker?s Performance with Work Stress as the Intervening Variable**

*Helmi Buyung Aulia Safrizal, Anis Eliyana, Kurnia Lail Febriyanti*

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- DOI: 10.31838/srp.2020.10.65

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- **A Comparative Study of Some Biochemical Blood Characteristics of Six Lines of Iraqi Local Female Chickens**

*Fatimah Abdullah Kamil, Nagam Khudhair, Ahmed Khalid.*

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- [» Abstract](#)
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- DOI: 10.31838/srp.2020.10.161

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- **Brain Hydatid Cyst in Neurosurgical Practice in AL-Nasiriyah City**

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- [» Abstract](#)
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- DOI: 10.31838/srp.2020.10.162

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- **AITCS as a Reliable Instrument for Evaluating IPC (Interprofessional Collaboration): A Systematic Review**

*Patima, Ridwan Amiruddin, Syahrir A. Pasinringi, Andi Ummu Salmah, Fridawaty Rivai, Anwar Mallongi, Noor Bahri Noer, Ariyanti Saleh, Rini Rachmawaty, Djazuli Chalidyanto, Aulia Insani Latif, Rasmawati Rasmawati, Rasdiyanah Rasdiyanah, Aidah Fitriani.*

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- **Estimation of Activity and Toxicity of Silver Nanoparticles loaded metronidazole against Giardia Lamblia**

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- DOI: 10.31838/srp.2020.10.163

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- **The Effect of Work-Family Conflict on Job Satisfaction with Organizational Commitment as the Moderator Variable**

*Diana, Anis Eliyana, Inanta Indra Pradana*

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- **The Effect of Gibberellic Acid GA3 and Benzyl Adenine BA on the Growth of Vitis Vinifera Halawani Seedlings and Their Content of Some Nutrients**

*Hussain Nory Rasheed AL-Karawi, Thaer Rasheed Awad AL-Zobaie.*

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- **Factors Affecting the Transformational Leadership of Small and Medium Medical Device Enterprises in Thailand**

*Sunatcha Chaowai, Parinya Siemuang, Jatuporn Ounprasertsuk, Pongsak Jaroengarmsamer, Phannee Rojanabenjakun, Tipvarin Benjanirat, Sasipen Krutchangthong.*

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- **The Effort to Lower Titanium Oxidation in the Sintering Process of Titanium Alloy: A Review**

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- **Cytokines Storm Of COVID-19 And Multi Systemic Organ Failure: A Review**

*Zubaida N.M Albarzanji, Thikra Abdullah Mahmood, Entedhar Rifaat Sarhat, Kasim Sakran Abass.*

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- **The Engagement and Working Satisfaction of Millennial Lecturers During the COVID-19 Pandemic: Differences in Gender Identity Perspectives**

*Despinur Dara, Anis Eliyana, Hamidah*

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- DOI: 10.31838/srp.2020.10.67

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- **HER-2/Neu Oncogene in Endometrial Cancer**

*Maather Baqer Hussein Al-Harmooshee*

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- **Cytotoxic Effect of Aqueous-Ethanol Extract of *Typha Domingensis* Pers. (Pollen) against Human Breast Cancer Cells in Vitro**

*Majed H. Karbon, Ali H. Alhammer.*

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- DOI: 10.31838/srp.2020.10.167

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- **Sociocultural Transformation in Efforts to Reduce Mortality of Infants in Bone Regency, Indonesia**

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- **The Effect Of Multi-Micronutrient Supplementation Since Preconception On Levels Of Malondialdehyde (Mda) For Pregnant Women**

*Rahayu Yekti, Lucy Widasari, Yustiyanti Monoarfa, Agussalim Bukhari, Nurhaedar Jafar, Anang Ottoluwa, Abdul Razak Thaha.*

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- **The Effect of Diabetes Type 1 on Some Blood and Biochemical Variables in Children**

*Mohammed Fadhil Abood, Riyadh Mohammed Jihad, Oqbah Abdul Halim*

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- DOI: 10.31838/srp.2020.10.13

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- **The Effect of Leadership Style, Organizational Culture and Job Satisfaction on Employee Performance with Organizational Commitment as the Intervening Variable**

*Bambang Raditya Purnomo, Anis Eliyana, Elvina Dyah Pramesti*

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- **Dietary Rehabilitation Effectiveness On Coronary Artery Diseases Patient's Outcomes**

*Masouda Hassan Abd El-Hamid Atrous, Hassnaa Eid Shaban Mosa, Nouf Abdullah Alroqaiba, Hanady Sh. Ibrahim Shehata Rania M Maher Alhalawany & Sabah E. Nady.*

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- **Evaluation of the Correlation of Trefoil Factor with Hemostatic Profile in Iraqi Diabetic Nephropathy Patients**

*Anwar Abd-Al-Hameed Kamal, Maysaa A. Hadi, Hussein Naji.*

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- **The Hepatoprotection Effect of the Asymmetric Curcumin Analogue Synthetic Product in Male Rat Abstract (*Rattus norvegicus* L.)**

*Immanuel Berly Delvis Kapelle, Wasmen Manalu, Meillisa Carlen Mainassy, Nini Munirah Renur, Shielda Natalia Joris.*

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- **Predict Some Soil Characteristics And Prepare Their Digital Maps From Remote Sensing Data**

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- **Mechanisms for Managing the Health Care System within the Conditions of the Coronavirus Pandemic (COVID-19)**

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- **Influence of Restoration Thickness and Auxillary Retentive Means on Marginal Gap of Occlusal Ceramic Veneers**

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- **The Effect of Work Family Conflict on Job Performance Through Emotional Exhaustion**

*Yos Horta Meliala, Anis Eliyana, Hamidah, Agung Dharmawan Buchdadi, M. Burhanudin Habibi.*

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- **Pharmacological Evaluation of Antidiabetic Activity of Chromolaena Odorata Leaves Extract in Streptozotocin-Induced Rats**

*Hanifah Yusuf, Yusni Yusni, Firdalena Meutia, Marhami Fahrani.*

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- **Determination of Cyproheptadine via Diverged(0-90o) Scattered Light Emitted through Irradiation of Low-Pressure Mercury Lamp and Two Solar Cells Detection Using CFIA**

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- **Combined Effect of Doxorubicin and Pyrogallol on Tongue Squamous Cell Carcinoma SCC-25 Cells, an in vitro Study**

*Rahma G Mostafa, Ehab S Abd-ElHamid, Amr H Mostafa El-Bolok, Enas A ELdin, and Safaa M Tohamy.*

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- **Knowledge, Attitude, and Behavior of Indonesian Society towards Covid-19 Pandemic**

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- **Prevalence of Retained Primary Teeth without Permanent Successors among Orthodontic Patients in Basrah City/ Iraq**

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- **A Comparative Study between Atorvastatin and Pitavastatin Toxicity on Liver and Kidney in Albino Rats**

*Zahraa Abed Al-kareem, Shatha Hussein Kadhim, Iman Hussein Naser.*

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- **Effects of Ethanol Extract from Soybean Meal on Plasma Lipid Level, Bile acid Concentration, Lipase Activity, Fecal Lipid Content and Weight Gain in Swiss Mice**

*Phuc Hung Nguyen, Ngoc Linh Nguyen, Thu Thao Lai, Van Hung Mai.*

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- **Features of the Investigation of Corruption Abuses in the Medical Industry**

*Kuzmenko O., Lazebnyi A., Komysniuk Yu., Yusupov V., Herasyenko L.*

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- **Use Of Rituximab In The Treatment Of Lupus Nephritis In Compares To Cyclophosphamide: A Prospective Cohort Study In Single Center Institution.**

*Laith Fathi F. Sharba, Sadiq Al Muhana, Yasir Fathi Sharba.*

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- **The Effect of after COVID-19 Human Resource Management Approaches on Organizational Entrepreneurship**

*Judeh Mahfuz, Nusairat Nawras, Al-Gasawneh Jassim, Ngah Abdul Hafaz, Salleh Hayatul, Bashiti Iman.*

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- **Germline Mutation of RAD51 Single Nucleotide Polymorphisms as Susceptibility Factor for Breast and Ovarian Cancer**

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- **Effect of e-Leadership Style, Organizational Commitment and Service Quality towards Indonesian School Performance**

*Denok Sunarsi, Nani Rohaeni, Retno Wulansari, Jeni Andriani, Ade Muslimat, Zackharia Rialmi, Endang Kustini, Lily Setyawati Kristianti, Dian Rostikawati, Aidil Amin Effendy, Agus Purwanto, Mochammad Fahlevi*

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- **Effect of Some Fermented Milk on Blood Picture of Hypercholesterolemic Rats**

*Mohammed Ahmed Jassim, Hani Sabbar Ayed, Hind Mohammed Saleh.*

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- **Features of Work of Psychologists with Different Age Groups**

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- **Antioxidant Effects of 1,8- Cineole Against Long Term DL-Polychlorinated Biphenyls (PCBs) Toxicity in Domestic Hen's Liver**

*Muna T. Al-musawi, Aws El-muntaser H. Ali, Anas A. Humadi, Bushra I. Al-Kaisei.*

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- **The Behavioral Effect of Anthocyanin from Purple Sweet Potatoes on Prenatally Stressed Offspring Mice**

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- **The Application of Geographic Information System for Assessing the Risk Level of Hypertension in Samut Songkhram Province**

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- **Broiler Chicken vs. Turkey Meat; which One Has the Least Bad Fat to Avoid Positive Case of COVID-19?**

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- **Nutritional Value and Acceptability from Drink Probiotic Yogurt with Sago Flour (Metroxylon Sagu Rottb) with Sexual Dysfunction in Postpartum Women**

*Mustamir Kamaruddin, Anjar Briliannita, Sriyanti, Pika Ayu Rahmadewi, Anwar Mallongi*

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- **Protection of the Right to Information on One's Health by Authorized State Bodies**

*Ihor Zozulia, Oleksandr Zozulia, Svitlana Melnychuk, Lyudmyla Luts, Tetiana Kronivets, Catherine Karmazina.*

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- **The Efficacy of Mindfulness Therapy with Family Centered Care Approach on Mental Recovery of People Living with HIV/AIDS (PLWHA) in Sorong City**

*Norma, Butet Agustarika, Anwar Mallongi*

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- **Association between Interleukin-23 Receptor Polymorphism and Asthma**

*Anfal A. K. AL-Bazoon, Thanaa M. Jouda, Ahmed H. Jasim*

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- **Dual Color -Chromogenic in Situ Hybridization Approaches to Evaluate HER2/Neu Gene Amplification in Breast Carcinomas**

*Shoroq Mohammed AL-Temimi and Adel Mosa AL-Rekabi*

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- **Prevalence of Nocturnal Enuresis and Its Associated Ultrasonic Findings in Children of Wasit**

*Mohammed Challob Murad, Ahmed Ali Obaid and Falah Mahdi Ali*

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- **Isolation & Clipping of Cystic Artery outside Versus inside Calot's Triangle Minimizes the Intraoperative Complications in Laparoscopic Cholecystectomy**

*Adel Mosa Al-Rekabi*

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- **Sensory Acceptance and Influence of Pumpkins (*Cucurbita moschata*) Flour in Making Crispy Noodles Toward Primary School Children of Bengkulu**

*Emy Yuliantini, Kamsiah, Andi Eka Yunianto*

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- **The expression level of PTEN-gene is a diagnostic tool for gene alteration in invasive ductal carcinoma of the Breast**

*Shoroq Mohammed AL-Temimi and Adel Mosa AL-Rekabi*

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### **Research Article**

- **Ultraviolet Light Application Model in Lowering Germs on Food Snacks at Elementary School in Makassar**

*Zaenab, Rafidah, Anwar Mallongi, Ashari Rasjid*

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### **Research Article**

- **Patient Health Information System for Discharge Planning in Nursing Services in Hospitals**

*Abdul Aziz Alimul Hidayat, Musrifatul Uliyah, Sukadiono, Nahdah Aulia Aziz Taufiqurrahman*

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- **Synthesis, Characterization and Corrosion Inhibition Study of New Heterocyclic Compounds and Schiff Base with [Co (II), Ni (II), Cu (II) and Hg (II)] Complexes**

*Wurood Ali Jaafar and Ruwaidah S. Saeed*

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- **Duck Meat, Delicious yet low in Unsaturated Fat; Comparative Study between Duck Meat Consumption in ASEAN toward the Number of COVID Cases**

*Maslichah Mafruchati*

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  - DOI: 10.31838/srp.2020.10.78
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### **Research Article**

- **Non-Toxic Fractions of *Streptomyces hygroscopicus* Subsp. *Hygroscopicus* Metabolite Suppressed the Growth of *Plasmodium falciparum* in Vitro Possibly through L-malate: Quinone Oxidoreductase (PfMQO) Mitochondrial Enzyme Inhibition**

*Alfian Wika Cahyono, Loeki Enggar Fitr, Nafisatuzzamrudah, Rivo Yudhinata Brian Nugraha, Rara Aulia, Fitria Febriliani, Dio Giovanni Ariel, Kana Mardhiyyah, Sri Winarsih, Suciati, Dian Japany, Erwahyuni Endang, Danang Waluyo*

**SRP. 2020; 11(10): 524 - 531**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.79

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### **Review Article**

- **Activization of Cognitive Activity of Students in Higher Education Institutions**

*Alona Prokopenko, Alla Vozniuk, Hennadii Leshchenko, Liliya Manchulenko, Alla Kramarenko, Oksana Mondich*

**SRP. 2020; 11(10): 144 - 146**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.24

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### **Review Article**

- **Factors Affecting Entrepreneurial Student Intention in Learning Technology**

*Bambang Leo Handoko, Septi Wifasari, Fahry Priandhana*

**SRP. 2020; 11(10): 532 - 536**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.80

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### **Research Article**

- **Mechanism of Bone Metabolism Interruption Due to High Intensity Physical Exercise**

*Gadis Meinar Sari, Soetjipto, Lilik Herawati.*

**SRP. 2020; 11(10): 836 - 843**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.125
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### **Review Article**

- **The Impact of European Educational Integration on the Process Study of Foreign Languages in Institutions of Higher Education of Ukraine**

*Vasyl Zheliaskov, Volodymyr Krasnopolskyi, Tetiana Sharhun, Victoriia Ihnatenko, Iryna Hinsirovska, Oksana Tymofyeyeva*

**SRP. 2020; 11(10): 147 - 155**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.25
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### **Research Article**

- **In Silico Prediction of Malayan Krai (Bungarus candidus) PLA2 Epitope**

*Nia Kurniawan, Coni Anggie Kurniasari, Fatchiyah*

**SRP. 2020; 11(10): 537 - 548**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.81
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### **Review Article**

- **The Process of Teaching a Foreign Language with the Use of Social Internet Applications**

*Myroslava Fabian, Olesia Stoika, Olga Maksymova, Natalia Shalyhina, Diana Kochmar, Olga Zhvava*

**SRP. 2020; 11(10): 156 - 159**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.26
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### **Review Article**

- **Interactive Teaching Methods as a Change in the Purpose of Modern Education**

*Leonid Orshanskyi, Volodymyr Krasnopol'skyi, Iryna Fednova, Lesia Vysochan, Tetiana Noval'ska, Oksana Ivantsiv*

**SRP. 2020; 11(10): 549 - 555**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.82

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### **Research Article**

- **The Effect of Sea Grapes (*Caulerpa cylindrica*) to Gastric Inflammatory Cell Infiltration Score and Catalase Activity in Indomethacin-induced Wistar Rats**

*Fitri Handajani, Sulistiana Prabowo*

**SRP. 2020; 11(10): 556 - 563**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.83

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### **Research Article**

- **Evaluation of *Agaricus* sp. and *Pleurotus* sp. Extracts Efficiency in *Aspergillus Flavus* Growth Inhibition and Aflatoxin B1 Reduction**

*Alia Haikal Hussain, Halima Zugher Hussein*

**SRP. 2020; 11(10): 564 - 569**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.84

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### **Review Article**

- **Limits and Restrictions on the Right to Information on One's Health**

*Nadiia Milov'ska, Tetiana Zanfirova, Lesia Vasylenko, Liudmyla Mozoliuk-Bodnar, Yuliia Kamardina*

**SRP. 2020; 11(10): 265 - 270**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.43
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### **Research Article**

- **The Effect of Silver Nanoparticles on BRAF Gene Expression**

*Gulboy Abdolmajeed Nasir, Mohammed Ayyed Najm, Ammar Lateef Hussein*

**SRP. 2020; 11(10): 570 - 575**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.85
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### **Research Article**

- **A Situation Analysis on the Use of Standardized-Herbal Medicines as Supportive Therapies for Dengue Hemorrhagic Fever (DHF) patients in Indonesia**

*Amirah Adlia, Ayu Vania Tobing, Auliya A. Suwantika.*

**SRP. 2020; 11(10): 844 - 848**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.126
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### **Research Article**

- **Aqueous Extract of Boswellia against Rifampicin Toxicity in rats**

*Amal Umran Mosa, Ban Hoshi khalaf and Salam Ahmed Abed*

**SRP. 2020; 11(10): 576 - 583**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.86
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### **Research Article**

- **Detection of the Toxin Associated Genes of Methicillin-Resistant Staphylococcus Aureus Using a Multiplex PCR Assay in Wasit General Hospitals**



*Rana Hussein Raheema and Ban Hamid Qaddoori*

**SRP. 2020; 11(10): 584 - 589**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.87

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### **Review Article**

- **Psychological Features of the Development of a Corporate Image**

*Nataliia Nakonechna, Iryna Synhaivska, Yuri Zhyvohliadov, Tatiana Malkova, Olga Vasilchenko*

**SRP. 2020; 11(10): 271 - 274**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.44

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### **Research Article**

- **Effect of VEGF on the Success of Dental Tissue Regeneration in Delayed Replantation of Avulsed Teeth**

*Lobna K Al-khafaji, Mukhaled L Ali, Ammar H. Shaalan, Athraa Y Al-hijazi*

**SRP. 2020; 11(10): 160 - 164**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.27

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### **Review Article**

- **Internet Addiction among University Students and its Associated Factors: A Cross-Sectional Study among College Students in Hanoi, Vietnam**

*Nguyen Thi Mai Lan, Lee Kyesun, Vu Dung, Nguyen Thi Thanh Huyen, Huynh Van Chan, Nguyen Thi Quy, Tran Thu Huong, Nguyen Thi Hoa Mai, Vu Thu Trang, Nguyen Van Hieu*

**SRP. 2020; 11(10): 590 - 596**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.88

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## Research Article

- **The Effect of Low-Calorie High Protein Diet on Insulin, TNF- $\alpha$  and P38MAPK Levels in Insulin-Resistant PCOS Mice Models**

*Hany Puspita Aryani, Budi Santoso, Bambang Purwanto, Sony Wibisono Mudjanarko, Budi Utomo*

**SRP. 2020; 11(10): 597 - 605**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.89

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## Review Article

- **Constitutional Legal Aspects of the Right to Access**

*Nataliya Zaiats, Nataliia Lazniuk, Oksana Gorova, Liudmyla Khoynatska*

**SRP. 2020; 11(10): 275 - 277**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.45

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## Research Article

- **Mother's Height and Calcium Intake Against Stunting among Children Aged 3-5 Years and The Impact on Child Development**

*Suryana, Andi Eka Yuniyanto, Yulia Fitri, Silvia Wagustina, Eva Fitriyaningsih, Nunung Sri Mulyani, Sanya Anda Lusiana, I Rai Ngardita*

**SRP. 2020; 11(10): 606 - 611**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.90

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## Research Article

- **Efficacy of Combinations of Piperacilline/Tazobactam, Ceftazidime, Amikacin and Bacteriophage against Enterobacteriaceae Sepsis in Neonates: In Vitro Study**

*Huda Husham Abdul-Jabar, AbdulKareem Hameed Abd, Ahmed Sahib Abdulamir*

**SRP. 2020; 11(10): 165 - 170**

- [>> Abstract](#)
- [>> PDF](#)
- DOI: 10.31838/srp.2020.10.28

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### **Review Article**

- **Features of Training Cadets in Physical Education in Military Institutions of Higher Education**

*Olena Konokh, Yevhen Karabanov, Nataliia Denysenko, Igor Sukhenko, Mykola Koteliukh, Ruslan Shevchenko*

**SRP. 2020; 11(10): 278 - 281**

- [>> Abstract](#)
- [>> PDF](#)
- DOI: 10.31838/srp.2020.10.46

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### **Research Article**

- **Overweight and OBES: The Impact of Lactobacillus Casei Strain Shirota on Cholesterol and Weight of Children in the Pandemic Time COVID-19**

*Rudy Hartono, Rusli, Mira Andini, Aswita Amir.*

**SRP. 2020; 11(10): 849 - 853**

- [>> Abstract](#)
- [>> PDF](#)
- DOI: 10.31838/srp.2020.10.127

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### **Research Article**

- **Spectrophotometric Determination of Micro Amount of Copper (II) Using a New of (Azo) Derivative, Study of Thermodynamic Functions and Their Analytical Application**

*Mustafa Hamid Atiyah and Alaa Frak Hussain.*

**SRP. 2020; 11(10): 171 - 181**

- [>> Abstract](#)
- [>> PDF](#)

- DOI: 10.31838/srp.2020.10.29

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### **Review Article**

- **Contribution Deposit Compliance: Income and Knowledge of BPJS Health Mandiri Participants**

*Yeni Riza, Wasis Budiarto, Khairul Anam, Nurul Indah Qariati, Ridha Hayati, Hilda Irianty, Asrinawati, Ahmad Yani.*

**SRP. 2020; 11(10): 854 - 858**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.128

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### **Review Article**

- **IMT AND VO2MAX Analysis on Junior Athletes, Futsal and Football Branches: Literature Scopus**

*Ruliando Hasea Purba.*

**SRP. 2020; 11(10): 859 - 867**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.129

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### **Review Article**

- **Features of Exemption from Liability for the Violation of the Right to Information**

*Tetyana Kurylo, Tetiana Shynkar, Anatolii Prytula, Uliana Andrusiv, Mariya Mykhayliv*

**SRP. 2020; 11(10): 282 - 285**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.47

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### **Review Article**

- **Microorganism-Based  $\beta$ -Glucan Production and their Potential as Antioxidant**

*Gemilang Lara Utama, Casey Dio, Elazmanawati Lembong, Yana Cahyana, Roostita L. Balia.*

**SRP. 2020; 11(10): 868 - 873**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.130

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### **Research Article**

- **The Effect of Infection with Papillomavirus on Tumor Markers, CA 125 and CA 15-3 In a Sample of Women Infected with this Virus in Iraq**

*Aseel Khalid Hameed*

**SRP. 2020; 11(10): 182 - 186**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.30

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### **Review Article**

- **Recent Updates on COVID-19 Vaccine Platforms and Its Immunological Aspects: A Review**

*Reviany V. Nidom, Arif N. M. Ansori, Setyarina Indrasari, Irine Normalina, Muhammad K. J. Kusala, Asep Saefuddin, Chairul A. Nidom.*

**SRP. 2020; 11(10): 807 - 818**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.121

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### **Review Article**

- **A Review of Salmonella sp. in Tilapia fish (*Oreochromis niloticus*) : Public Health Importance**

*Azhar Muhammad Helmi, Akhmad Taufiq Mukti, Agoes Soegianto, Ketut Mahardika, Indah Mastuti, Mustofa Helmi Effendi, Hani Plumeriastuti.*

**SRP. 2020; 11(10): 819 - 826**

- [» Abstract](#)
- [» PDF](#)

- DOI: 10.31838/srp.2020.10.122

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### **Review Article**

- **Total Flavonoid Levels of Ethanol Extract and Ethyl Acetate Fraction Dry Shallots (*Allium cepa* L. var. Garden Onion of Brebes) with Maceration Methods Using UV-Vis Spectrophotometry**

*Heru Nurcahyo, Sri Adi Sumiwi, Eli Halimah, Gofarana Wilar*

**SRP. 2020; 11(10): 286 - 289**

- >> Abstract
- >> PDF
- DOI: 10.31838/srp.2020.10.48

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### **Review Article**

- **Subjects of the Right to Information on One's Health in Private and Public Law**

*Yurii Kuryliuk, Stanislav Filippov, Iryna Kushnir, Hanna Shvedova, Volodymyr Berizko.*

**SRP. 2020; 11(10): 827 - 831**

- >> Abstract
- >> PDF
- DOI: 10.31838/srp.2020.10.123

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### **Research Article**

- **Effects of *Hypericum Perforatum* on Histology of the Testes and Sex Hormones of Male Rats**

*Adil Abdulrahman Mustafa, Khalaf Nahar Ahmad, Yasir I Abbass, Azzawi M Hadi.*

**SRP. 2020; 11(10): 832 - 835**

- >> Abstract
- >> PDF
- DOI: 10.31838/srp.2020.10.124

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### **Research Article**

- **Effect the Extracts of *Agaricus Bioporus* on Some Biological Aspects of *Musca Domestica* (Linnaeus1857) (Diptera: Muscidae)**

*Sarah Kadhim Al-Rahimy, Maysaa Taqi Al-Khazali, Rafid Abbas Al-Essa, Iqbal Khawwam Khshayyish*

**SRP. 2020; 11(10): 187 - 192**

- [>> Abstract](#)
- [>> PDF](#)
- DOI: 10.31838/srp.2020.10.31

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### **Review Article**

- **In Silico Study on Antibacterial Activity and Brazilein ADME of Sappan Wood (Caesalpinia Sappan L.) Against Escherichia coli (Strain K12)**

*Dwi Krihariyani, Eddy Bagus Wasito, Isnaeni Isnaeni, Siswandono Siswodihardjo, Wiwik Misaco Yuniarti, Entuy Kurniawan*

**SRP. 2020; 11(10): 290 - 296**

- [>> Abstract](#)
- [>> PDF](#)
- DOI: 10.31838/srp.2020.10.49

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### **Research Article**

- **Study of Correlation between Some Serological Parameters with Brucella Militance Infection**

*Amidah Ali Atiyah, Asmaa Essa Mahmood, Sahar Abd Al-Wahhab, Nael Mustafa*

**SRP. 2020; 11(10): 193 - 198**

- [>> Abstract](#)
- [>> PDF](#)
- DOI: 10.31838/srp.2020.10.32

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### **Research Article**

- **Did Trilogy Leadership Style, Organizational Citizenship Behaviour (OCB) and Organizational Commitment (OCO) Influence Financial Performance? Evidence from Pharmacy Industries**

*Harjoni Desky, Mukhtasar, Muhammad Istan, Yeni Ariesa, Inge Bunga Mira Dewi, Mochammad Fahlevi, Muhammad Nur Abdi, Rinto Noviantoro, Agus Purwanto*

**SRP. 2020; 11(10): 297 - 305**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.50
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### **Research Article**

- **Adaptive Strategy of Women`s Leprosy in Indonesia: Psychic Experience of Women with Leprosy in Living a Community Life**

*Abd. Nasir, Ah Yusuf, Muhammad Yulianto Listiawan, Susilo Harianto, Nuruddin, Nuh Huda*

**SRP. 2020; 11(10): 306 - 312**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.51
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### **Review Article**

- **Pharmaceutical Business Competition in Indonesia: A Review**

*Heri Erlangga, Wa Ode Sifatu, Dimas Wibisono, Ade Onny Siagian, Rudi Salam, Mahnun Mas' adi, Gunartin, Riri Oktarini, Cornelia Dumarya Manik, Nani, Ahmad Nurhadi, Denok Sunarsi, Agus Purwanto, Gatot Kusjono*

**SRP. 2020; 11(10): 617 - 623**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.92
- 

### **Review Article**

- **Efficacy of Stigma maydis (Corn silk) in Reducing Blood Sugar Level and Subduing Periodontal Inflammation**

*Irene Edith Rieuwpassa, Rafikah Hasyim, Dwi Putri Wulansari, Risfah Yulianty, A. St. Asmidar Anas, Sitti Rafiah, Yu Ri Kim.*

**SRP. 2020; 11(10): 1 - 6**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.1
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## Research Article

- **Health-Promoting Behaviors and Related Factors in Patients with Chronic Diseases in a Rural Community**

*Wanich Suksatan, Jatuporn Ounprasertsuk*

**SRP. 2020; 11(10): 624 - 627**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.93

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## Research Article

- **Analysis of Current Models of the Palliative Medical Care at the level of Separate Subjects of the Russian Federation**

*Lyudmila Alexandrovna Ertel, Marina Filippovna Mikaelyan, Irina Nikolaevna Iyro, Gasbulla Suleymanovich Barkaev, Andrey Borisovich Goryachev, Tatyana Gennadyevna Mogilenko, Stella Vazgenovna Mirzoyan, Madina & 1040;liyevna Garumova*

**SRP. 2020; 11(10): 628 - 633**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.94

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## Research Article

- **Anticancer Activity of Phyllanthus Niruri Linn Extract in Colorectal Cancer Patients: A phase II Clinical Trial**

*Muhammad Sayuti, Ignatius Riwanto, B. Parish Boediono, Teuku Ilhami Surya Akbar*

**SRP. 2020; 11(10): 313 - 317**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.52

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## Review Article

- **Did PDCA Cycle, Service Quality and Innovation Capability Influence Private Universities Performance?**

*Lukman Hakim, Kemas Imron Rosadi, Minnah El Widdah, Kasful Anwar US, Shalahudin, Mahmud MY.*

**SRP. 2020; 11(10): 874 - 883**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.131

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### **Review Article**

- **Dentists Attitudes and Barriers towards Chairside Medical Conditions Screening in a Dental Setting in Makassar, Indonesia**

*Rasmidar Samad, Burhanuddin Daeng Pasiga, Rini Pratiwi, Fuad Husain Akbar, Nursyamsi Djamaluddin, Muhammad Hidayat Syahrudin.*

**SRP. 2020; 11(10): 7 - 17**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.2

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### **Research Article**

- **The Identification of Pork Contamination on Beef by Polymerase Chain Reaction (PCR)**

*Mustofa Helmi Effendi, Shelma Warda Afdilah, Dhandy Koesoemo Wardhana, Fredy Kurniawan,*

**SRP. 2020; 11(10): 634 - 634**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.95

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### **Research Article**

- **The Effect of Gel *Abelmoschus Manihot* (L.) Medik Leaf Extract on Second Degree Burn Wound Healing Process**

*Wiwik Misaco Yuniarti, Erva Fatmaretta, Laila Nur Hidayati, Nadhila Arieska, Bambang Sektiari Lukiswanto.*

**SRP. 2020; 11(10): 884 - 889**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.132
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### **Research Article**

- **The Effect of Anthocyanin of Whole-Grain Pigmented Rice Attenuated Visceral Fat, Cholesterol, LDL and PPAR? Gene Cascade in Dyslipidemia Rat**

*Fatchiyah Fatchiyah, Anna Safitri, Rista Nikmatu Rohmah, Lidwina Faraline Triprisila, Nia Kurnianingsih, Yudhistira Nugraha, Sisca Fajriani, Hazna Noor Meidinna, James Ketudat Robert-Cairns*

**SRP. 2020; 11(10): 318 - 327**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.53
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### **Review Article**

- **A Systematic Literature Review of Education Financing Model in Indonesian School**

*Gunartin, Ade Onny Siagian, Khayatun Nufus, Nur' aini Yusuf, Hadi Supratikta, Ali Maddinsyah, Awaluddin Muchtar, Widya Intan Sari, Denok Sunarsi, Irfan Rizka Akbar, Nurmin Arianto, Agus Purwanto, Noryani, Hadion Wijoyo.*

**SRP. 2020; 11(10): 638 - 644**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.96
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### **Review Article**

- **The Relationship between Chin Pressure and the Severity of TMD in Violin Players**

*Mohammad Dharma Utama, Andi Adytha M.I.R, Ike Damayanti Habar, Acing Habibie Mude, Edy Machmud, Irfan Dammar, Vinsensia Launardo.*

**SRP. 2020; 11(10): 18 - 21**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.3

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## **Research Article**

- **The Effect of Adsorbent Composition: Quartz Sand/Andisol Soil/Zeolite/Activated Carbon Against Mn, Fe, BOD, and COD in Citarum River Eater Cleaning Progress**

*Muhammad Sholeh, Pranoto, Sri Budiastuti, Sutarno.*

**SRP. 2020; 11(10): 645 - 652**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.97

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## **Review Article**

- **The Role and Place of Information and Communication Technologies in the Formation of Professional Competencies of Higher Education**

*Tetiana Shabelnyk, Nataliia Rotanova, Oksana Diachenko, Maryna Netreba, Liudmyla Tonkykh, Olena Tsilmak.*

**SRP. 2020; 11(10): 890 - 893**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.133

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## **Review Article**

- **A Systematic Review of Population Pharmacokinetics of Carbamazepine**

*Janthima Methaneethorn, Manupat Lohitnavy, Nattawut Leelakanok.*

**SRP. 2020; 11(10): 653 - 669**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.98

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## **Review Article**

- **Public Management in the Activity of Educational Institutions in the Context of Autonomy of their Work (Under the Conditions of Crises and Covid-19)**

*Budanova Liana, Filyanina Nelya, Nosyk Oksana, Andriyenko Mykola, Slepchenko Anzhela, Zastrozhnikova Irina*

**SRP. 2020; 11(10): 328 - 334**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.54

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### **Review Article**

- **Attachment Systems for Implant-Supported Overdentures in Edentulous Mandible: A Systematic Review**

*Acing Habibie Mude, Muhammad Iqbal, Irfan Dammar, Vinsensia Launardo, Sutiyo.*

**SRP. 2020; 11(10): 22 - 24**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.4

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### **Research Article**

- **Prevalence of Refractive Errors Among Primary School Children (6-15 Yrs) In Al-Khartoum- Sudan**

*Noaman Mukbel Ghalib, Samira Mohammed Ibrahim, Nasraddin Othman Bahakim.*

**SRP. 2020; 11(10): 674 - 675**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.99

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### **Review Article**

- **Evaluation of the Application of Training in Higher Education Institutions as a Technology of Active Learning**

*Nataliia Kanosa, Iana Chaika, Inna Lytvynova, Tetiana Yakovyshyna, Valentyna M. Uspenska, Dmytro Kostiuk*

**SRP. 2020; 11(10): 199 - 202**

- [» Abstract](#)

- [» PDF](#)
  - DOI: 10.31838/srp.2020.10.33
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### **Review Article**

- **Effect of ISO 9001, ISO 45001 and ISO 14000 toward Financial Performance of Indonesian Manufacturing**

*Mukhlisatul Jannah, Mochammad Fahlevi, Julinta Paulina, Budi Sulistiyo Nugroho, Agus Purwanto, Milana Abdillah Subarkah, E. Kurniati, Teguh Setiawan Wibowo, Kasbuntoro, Nawang Kalbuana, Yoyok Cahyono.*

**SRP. 2020; 11(10): 894 - 902**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.134
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### **Review Article**

- **Development of Performance Appraisal Sustainable Theory of Sharia Banks in Indonesia**

*Ahmad Sodiq, Ririn Tri Ratnasari, Imron Mawardi.*

**SRP. 2020; 11(10): 679 - 685**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.100
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### **Research Article**

- **Combination Therapy of Eurycomanone and Doxorubicin As Anticancer on T47D and MCF-7 Cell Lines**

*Hanifah Yusuf, Denny Satria, Suryawati Suryawati, Marhami Fahriani*

**SRP. 2020; 11(10): 333 - 341**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.55
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### **Review Article**

- **Pedagogical Principles of Training Specialists in Public Administration and Management in the System of Vocational Education**

*Nataliia Bakhmat, Lyudmila Kotliar, Tetiana Zhytomyrska, Volodymyr Slabko, Viktoriia Zhurian, Oksana Pilevych, Iryna Smyrnova*

**SRP. 2020; 11(10): 203 - 207**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.34

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### **Review Article**

- **Sustainable, Pro-Poor and Humane Waqf Management: A Literature Study of Evidence-Based Success Criteria of Waqf Managers**

*Siti Nur Indah Rofiqoh, Ririn Tri Ratnasari, Raditya Sukmana, Mohammad Ala' uddin, Alimin, Iskandar Ritonga.*

**SRP. 2020; 11(10): 903 - 910**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.135

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### **Review Article**

- **Anti-Corruption Policy under the Conditions of Overcoming the Consequences of the Coronavirus Pandemic**

*Anatolii Novak, Vitalii Bashtannyk, Zoriana Buryk, Oksana Parkhomenko-Kutsevil, Mykola Andriyenko.*

**SRP. 2020; 11(10): 911 - 916**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.136

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### **Review Article**

- **Notch Pathway and its Role in Cardiovascular System: Review**

*Amira M. Badr, Yasmen F. Mahran*

**SRP. 2020; 11(10): 342 - 349**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.56
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**Review Article**

- **Modern Problems of Medical and Pharmacological Education**

*Olena Malinina, Ganna Gnyloskurenko, Vitalii Chaika, Iryna Borysiuk, Rayisa Yuriy.*

**SRP. 2020; 11(10): 917 - 922**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.137
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**Review Article**

- **Comparison of *Jatropha curcas* (Linn) Leaf Extract and Nystatin Effectivity on *Candida albicans* Growth Inhibition**

*Ali Yusran, Fuad Husain Akbar, Fathimah.*

**SRP. 2020; 11(10): 26 - 30**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.5
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**Review Article**

- **The Impact of Using Interactive Boards on Secondary School Students? Learning Outcomes in Egypt in the Computer Skills Course**

*Mohammed Elmetwali Mohammed Amer.*

**SRP. 2020; 11(10): 923 - 930**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.138
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**Research Article**



- **Study the Glucose Level in Obese Breast Cancer Patients**

*Sheerin H. Abbas, Rula Dhahir Abdulmohsin.*

**SRP. 2020; 11(10): 208 - 212**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.35

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### **Review Article**

- **Protection of the Rights of Public Utilities Market Participants (In the Context of Poverty Prevention)**

*Gulnara Dzhumageldiyeva, Inna Zablodska, Irina Yukhymenko-Nazaruk, Vita Dovgaliuk, Irina Suprunova, Ulyana Gylka.*

**SRP. 2020; 11(10): 931 - 938**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.139

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### **Research Article**

- **Formulation and in Vitro Evaluation of Valsartan Flash Tablet**

*Mohammed Sattar, Malathe A. Alshawi, Mazin Nadhim Mosa*

**SRP. 2020; 11(10): 213 - 219**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.36

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### **Review Article**

- **Dentin Matrix Protein-1 (DMP-1) Expression after Application of Haruan Fish Extract (*Channa striata*) on Inflamed Wistar Rat Dental Pulp**

*Andi Sumidarti, Christine Anastasia Rovani, Juni Jekti Nugroho, Bulkis Thahir.*

**SRP. 2020; 11(10): 31 - 35**

- [» Abstract](#)

- [» PDF](#)
  - DOI: 10.31838/srp.2020.10.6
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### **Review Article**

- **Molecular Detection of Parvovirus B19 and Immunohistochemical Localization of Interleukin 6 of Tissues from Thyroid Cancer**

*Jinan MJ Al-saffar, Saad Hasan Mohammed Ali, Shakir H. Mohammed Al-Alwany.*

**SRP. 2020; 11(10): 939 - 943**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.140
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### **Review Article**

- **Study the Relationship between Roughness and Stimulus Levels and Their Impact on OAEs**

*Adnan M. A. Al-Maamury, Fatima Q. Al-Rawi*

**SRP. 2020; 11(10): 220 - 224**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.37
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### **Review Article**

- **Isolation and Diagnosis of Bacteria from Women with Urinary Tract Infection and Study of Antibiotic Susceptibility**

*Rafal Ahmed Lilo, Dalal mohammed, zahraa M. Al-Tae, Zeena Hadi Obaid Alwan and Rajaa Mahmoud Ibrahim AL-Jasim.*

**SRP. 2020; 11(10): 944 - 947**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.141
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### **Review Article**

- **Legal Reforms of the Land Market in the Countries of Central and Eastern Europe and the Development of Their Financial and Credit Institutions**

*Oleksandr Tereshchuk, Mykola Yasynok, Volodymyr & 1050;roitor, Alla Zemko, Dmytro Yasynok, Mykola Danevych.*

**SRP. 2020; 11(10): 948 - 953**

- [>> Abstract](#)
- [>> PDF](#)
- DOI: 10.31838/srp.2020.10.142

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### **Research Article**

- **Effectiveness of Fucoïdan Extract from Brown Algae to Inhibit Bacteria Causes of Oral Cavity Damage**

*Nurlindah Hamrun, Sri Oktawati, Asmawati, Irene, Hardianti Maulidita Haryo, Ira Farwiany Syafar, Andi Nurazizah Almaidah.*

**SRP. 2020; 11(10): 686 - 693**

- [>> Abstract](#)
- [>> PDF](#)
- DOI: 10.31838/srp.2020.10.101

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### **Review Article**

- **The Effectiveness of Giving Cork Fish Nugget to Increase Endurance of Toddlers at Community Health Centers Sentani Jayapura Regency**

*Ester Rumaseb, Berliana Tampubolon, Jems K.R. Maay.*

**SRP. 2020; 11(10): 954 - 958**

- [>> Abstract](#)
- [>> PDF](#)
- DOI: 10.31838/srp.2020.10.143

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### **Research Article**

- **CERDIK Behavior as a Risk Factor for Individuals with Non-Communicable Diseases**

*Suprajitno, Sri Mugianti*

**SRP. 2020; 11(10): 350 - 360**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.57

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### **Research Article**

- **Development of a Method for Determination of Diphenhydramine HCl and Ibuprofen in Pharmaceutical Preparations (Tablets)**

*Seemaa Hameed Ahmed*

**SRP. 2020; 11(10): 225 - 229**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.38

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### **Review Article**

- **The Recurrence Rate of Oral Benign Lesions which Treated with Dredging and Obturator**

*Andi Tajrin, Muhammad Ruslin, Abul Fauzi, Muhammad Irfan Rasul, Edy Machmud, Acing Habibie Mude, Muhammad Iqbal, Irfan Dammar, Mutia Nurul Syahrani.*

**SRP. 2020; 11(10): 36 - 39**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.7

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### **Research Article**

- **Water and Microbial Contents in Moringa Oleifera Seed Flour as Food Supplement to Prevent Stunting**

*Adriyani Adam, Rudy Hartono, Andi Salim, Zaki Irwan, Ali Imran.*

**SRP. 2020; 11(10): 694 - 697**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.102

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### **Review Article**

- **Implementation of Health Promotion Methods for the Prevention of Mother-to-Child HIV Transmission among Pregnant Women: A Literature Review**

*Dhesi Ari Astuti, Mohammad Hakimi, Yayi Suryo Prabandari, Ida Safitri Laksanawati, Atik Triratnawati*

**SRP. 2020; 11(10): 361 - 366**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.58

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### **Review Article**

- **Immunohistochemistry And Ploidy Analysis To Assist Histopathological Diagnosis Of Molar Diseases Approach**

*Asaad Abd Alhussain Mohammad Al-Shouk, Alaa S. Hachem, Layla Safar Jebur Khaledi.*

**SRP. 2020; 11(10): 959 - 964**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.144

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### **Review Article**

- **Formation of Learning Research Skills Through Solving Arithmetic Problems**

*Rabiga I. Kenzhebekova, Saule S.Kozhadeldiyeva, Kulahmet Moldabek, Louise A. Rizaeva, Kenzhegul U. Kazybayeva.*

**SRP. 2020; 11(10): 698 - 705**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.103

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### **Review Article**

- **Critical Success Factors Affecting the Implementation of TQM in Public Hospitals: A Case Study in UAE Hospitals**

*Ahmad Aburayya, Muhammad Alshurideh, Amina Al Marzouqi, Osama Al Diabat, Alanood Alfarsi, Roberto Suson, Said A. Salloum, Dhoha Alawadhi and Aisha Alzarouni*

**SRP. 2020; 11(10): 230 - 242**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.39

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### **Case Report**

- **Coronavirus Disease (COVID-19): A Regional Autonomy Point of View**

*Mansyur Achmad, Ashariana.*

**SRP. 2020; 11(10): 706 - 711**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.104

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### **Research Article**

- **The Effect of Curcumin in Core-Shell Nanoparticle as Therapy in Radiotherapy-Induced Hyposalivation**

*Nanda Rachmad Putra Gofur, Aisyah Rachmadani Putri Gofur, Kemal Alif Athallandi, Ayu Anggraini Broto Nagoro, Soesilaningtyas, Rizki Nur Rachman Putra Gofur, Mega Kahdina, Hernalia Martidal Putri*

**SRP. 2020; 11(10): 367 - 370**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.59

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### **Review Article**

- **Application Of Self Efficacy Model To Improvement Of Self Care, Self Esteem And Self Efficacy In Patients With HIV AIDS At Community Health Centers In The Mimika District, 2020**

*Jems KR Maay, Blestina Maryorita.*

**SRP. 2020; 11(10): 965 - 969**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.145

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### **Review Article**

- **Factors Affecting Internally Displaced Persons Returning to their Home Cities**

*Diaa K. Abd Ali, Mansor K. Abd-Ali, Wid L. Meseer, Sabreen G. Gazal.*

**SRP. 2020; 11(10): 970 - 975**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.146

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### **Research Article**

- **Study the prevalence of smoking phenomenon among institute students at the city of Nasiriya / Iraq**

*Munther Kamil Oudah.*

**SRP. 2020; 11(10): 976 - 980**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.147

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### **Review Article**

- **The Problem Of Health Quality Of Medical Personnel In The Context Of Social Reform**

*Mamytbekova S., Raushanova A., Beisbekova A., Salkhanova A, Kainarbayeva M., IKuziyeva G.*

**SRP. 2020; 11(10): 712 - 714**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.105

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### **Review Article**

- **Optimization Of Microencapsulation Process Of Green Coffee Extract With Spray Drying Method As A Dietary Supplement**

*Dodyk Pranowo, Claudia Gadizza Perdani, Tiara Ayu Prihardhini, Susingih Wijana, Ahmad Syihab Fahmi QMR, Defrian Marza Arisandi.*

**SRP. 2020; 11(10): 715 - 721**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.106

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**Review Article**

- **Comparison of incidence of three major pathogens causing bovine subclinical mastitis in relation to SCC and enzymatic activities in large and small dairy herds in Egypt**

*Akram M. Nabih Elsyed, Refai, M. K., Hatem, M. E., Hamouda, R.H., and Samir, A..*

**SRP. 2020; 11(10): 981 - 995**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.148

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**Review Article**

- **Effect of Leadership Style Toward Indonesian Education Performance in Education 4.0 Era: A Schematic Literature Review**

*Suyudi, Budi Sulistiyo Nugroho, Minnah El Widdah, Aep Tata Suryana, Tatang Ibrahim, Megan Asri Humaira, Moh. Nasrudin, Muhammad Sultan Mubarok, Muhammad Taufiq Abadi, Aprilian Ria Adisti, Silvy Sondari Gadzalia, Muhammad Rikza Muqtada, Agus Purwanto, Mochammad Fahlevi, Yuli Sudargini*

**SRP. 2020; 11(10): 371 - 378**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.60

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**Review Article**

- **Nutritional Education Model Through Crossword Puzzles Toward Knowledge And Macro Nutrient Intake Of Primary School Student In Bengkulu City**

*Kamsiah, Emy Yuliantini, Andi Eka Yunianto.*

**SRP. 2020; 11(10): 722 - 725**

- [» Abstract](#)
- [» PDF](#)



- DOI: 10.31838/srp.2020.10.107

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### **Review Article**

- **Positive Psychology Intervention for Promoting Mental Health, Life Satisfaction and Happiness Level among Adolescents**

*Amal A. El-Abbassy, Alyaa Hosam El Din Salam, Kariema I. EL Berry, Reda Elfeshawy.*

**SRP. 2020; 11(10): 996 - 1008**

- >> Abstract
- >> PDF
- DOI: 10.31838/srp.2020.10.149

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### **Review Article**

- **Stain Resistance of Various Composite materials After Surface Sealant Application**

*Hanaa Abduljabbar Saleh, Othman Husham Abdulhameed, Hussein Muhammed Wajih.*

**SRP. 2020; 11(10): 1009 - 1012**

- >> Abstract
- >> PDF
- DOI: 10.31838/srp.2020.10.150

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### **Research Article**

- **Why Do People Fail to Comply with the Smoking Ban in Public Places? (The Case of Jayapura City, Indonesia)**

*Wahyuti, Darmawan Salman, Bastiana, Andi Agustang, Arwan, Ahmad Yani.*

**SRP. 2020; 11(10): 732 - 736**

- >> Abstract
- >> PDF
- DOI: 10.31838/srp.2020.10.109

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### **Research Article**

- **Overview of Health Workers' Knowledge of Pre-Eclampsia in Gowa Regency, Sulawesi Selatan, Indonesia: Cross-sectional Study**

*Hasnah, Muh Syafar, Ansariadi, Ummuh Salmah, Kadek Ayu, Ratnasari and Astuti.*

**SRP. 2020; 11(10): 737 - 741**

- [>> Abstract](#)
- [>> PDF](#)
- DOI: 10.31838/srp.2020.10.110

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### **Review Article**

- **The Ideal Treatment in Dentistry during Covid-19 Pandemic**

*Ardiansyah S. Pawinru.*

**SRP. 2020; 11(10): 40 - 44**

- [>> Abstract](#)
- [>> PDF](#)
- DOI: 10.31838/srp.2020.10.8

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### **Research Article**

- **Development Of Zinc-Enriched Medicinal And Food Plants**

*Anton Syroeshkin, Maria Makarova, Tatiana Maksimova, Tatiana Pleteneva, Igor Zlatskiy.*

**SRP. 2020; 11(10): 726 - 731**

- [>> Abstract](#)
- [>> PDF](#)
- DOI: 10.31838/srp.2020.10.108

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### **Research Article**

- **Prediction of Flick Density in the Rainy and Dry Seasons Based on Health Services, Behavior, Environmental Conditions, and Breeding Place in Banjarbaru City Using Partial Least Square**

*Isnawati, Bambang W. Otok*

**SRP. 2020; 11(10): 379 - 386**

- [>> Abstract](#)
- [>> PDF](#)
- DOI: 10.31838/srp.2020.10.61

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### Review Article

- **Gross and histological investigations on the cecum of the black-crowned night heron (*Nycticoarx nycticorax*)**

*Ramzi Abdulghafoor Abood Al-Agele, Ammar Ismail Jabbar and Raad Shaalan Ibrahim.*

**SRP. 2020; 11(10): 1013 - 1017**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.151

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### Review Article

- **Comparison between Calcium Hydroxide (CH) and Mineral Trioxide Aggregate (MTA) as Pulp Capping Agent: A Systematic Review**

*Aries Chandra Trilaksana, Harmiyati Gappar*

**SRP. 2020; 11(10): 45 - 48**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.9

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### Review Article

- **Molecular detection of antibiotic resistance genes and biofilm production among uropathogenic bacteria**

*Rawa Abdul Redha Aziz, Elaf Sameer.*

**SRP. 2020; 11(10): 1018 - 1038**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.152

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### Review Article

- **THE EFFECT OF LUMBRICUS RUBELLUS EXTRACTS ON IL-4, IL-10, IgE, AND EOSINOFIL LEVELS IN ATOPIC DERMATITIS PATIENT**

*Farida Tabri, Pipim Septiana Bayasari, Rosani Sri Camelia, Anis Irawan Anwar, Anni Adriani, Farida Ilyas.*

**SRP. 2020; 11(10): 1039 - 1065**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.153

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### **Research Article**

- **Spectrophotometric Determination of Nitrofurantoin in its Bulk and Pharmaceutical Formulations**

*Khawla Salman Abd-Alrasso, Mohammed Sattar, Mazin Nadhim Mosa*

**SRP. 2020; 11(10): 243 - 251**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.40

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### **Review Article**

- **A Review of an Important Medicinal Plant: *Alpinia galanga* (L.) Willd**

*Aswin Rafif Khairullah, Tridiganita Intan Solikhah, Arif Nur Muhammad Ansori, Amaq Fadholly, Sancaka Cashyer Ramandinianto, Ribby Ansharieta, Agus Widodo, Katty Hendriana Priscilia Riwu, Naimah Putri, Annise Proboningrat, Muhammad Khaliim Jati Kusala, Briantono Willy Rendragraha, Akyun Rozaqi Syah Putra, Azharuddin Anshori*

**SRP. 2020; 11(10): 387 - 395**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.62

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### **Review Article**

- **Transactions with the Personal Non-Property Right**

*Svitlana Iasechko, Oleksii Zaitsev, Viktoriia Kozhevnykova, Kostiantyn Melnyk, Oleh Kulchii*

**SRP. 2020; 11(10): 49 - 52**

- [» Abstract](#)

- [» PDF](#)
  - DOI: 10.31838/srp.2020.10.10
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### **Research Article**

- **Packaging Development of Bangchang Chili Paste in Bangchang Community, Amphawa District, Samut Songkhram**

*Phanee Rojanabenjakun, Jatuporn Ounprasertsuk, Tipvarin Benjanirat, Phinkamon Sangman, Paweesuda Srikhao, Tanwarat Duangsomruay.*

**SRP. 2020; 11(10): 1080 - 1086**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.155
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### **Review Article**

- **Developing Model of Halal Food Purchase Intention among Indonesian Non-Muslim Consumers: An Explanatory Sequential Mixed Methods Research**

*Hery Purwanto, Muchamad Fauzi, Ratna Wijayanti, Khothibul Umam Al Awwaly, Imam Jayanto, Mahyuddin, Agus Purwanto, Mochammad Fahlevi, Hendri Hermawan Adinugraha, Rahmi Andini Syamsudin, Angga Pratama, Nurmin Ariyanto, Denok Sunarsi, Elizabeth Tika Kristina Hartuti, Jasmani*

**SRP. 2020; 11(10): 396 - 407**

- [» Abstract](#)
  - [» PDF](#)
  - DOI: 10.31838/srp.2020.10.63
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### **Research Article**

- **C-Reactive Protein is Associated with the Severity of Periodontal Disease ? An Observational Study Among Acute Myocardial Infarction Patients**

*Samer Majeed Mohammed, Aliaa Sameer Hasan, Hayder Abdul Amir Makki Al-Hindy, Mazin J. Mousa*

**SRP. 2020; 11(10): 252 - 257**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.41

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### Research Article

- **The Effectiveness of Basic Life Support Activities in Lower Secondary School Children Wat Lat Peng School, Samut Songkhram Province**

*Jatuporn Ounprasertsuk, Chonthicha Wongthong.*

**SRP. 2020; 11(10): 1087 - 1090**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.156

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### Research Article

- **The Efficacy of Healthy Stand on Back Pain in Office Syndrome**

*Pongsak Jaroengarmsamer, Boonsiri Keawtongpan, Phannee Rojanabenjakun, Jatuporn Ounprasertsuk, Tipvarin Benjanirat, Sasipen Krutchangthong, Sunatcha Choawai.*

**SRP. 2020; 11(10): 1091 - 1098**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.157

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### Review Article

- **Nanomaterial Applications of Titanium Dioxide Nanoparticles as Antibacterial Agent against Multi-Drug Resistant Streptococcus Pneumoniae**

*Amal Talib Al-Sa'ady and Falah H. Hussein.*

**SRP. 2020; 11(10): 53 - 63**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.11

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### Review Article

- **Effect of Ecological, Servant dan Digital Leadership Style Influence University Performance? Evidence from Indonesian Universities**

*Abdul Quddus, Budi Sulistiyo Nugroho, Lukman Hakim, M. Sidi Ritaudin, Een Nurhasanah, Abin Suarsa, Umum Budi Karyanto, Rahman Tanjung, Hendar, Versiandika Yudha Pratama, Husni Awali, Abdul Mufid, Agus Purwanto, Mochammad Fahlevi, Yuli Sudargini*

**SRP. 2020; 11(10): 408 - 417**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.64

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### **Research Article**

- **The Role of Efflux Pump *adeJ* Gene in Levofloxacin Resistance among *A.baumannii***

*Ali M Abdelaal, Suhad S Mahmood.*

**SRP. 2020; 11(10): 1105 - 1110**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.159

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### **Research Article**

- **Role of Plant Growth Regulators in Gene Expression of SGR Gene Responsible for Stay Green of Wheat Varieties**

*Ali Nadhim Farhood, Nadhim Abdul Razzaq Merza, Muhnned Musa Shukan, Aws Ali Mohammed, Auday Hamid Taha.*

**SRP. 2020; 11(10): 1111 - 1120**

- [» Abstract](#)
- [» PDF](#)
- DOI: 10.31838/srp.2020.10.160

# A Review of *Salmonella sp.* in Tilapia fish (*Oreochromis niloticus*) : Public Health Importance

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## ABSTRACT

Tilapia fish or *Oreochromis niloticus* is a food security commodity from the fisheries sector and is traded internationally, but in Asian countries tilapia aquaculture is mostly maintained using traditional systems, besides that homemade feed is used to reduce production costs. Cultivation of tilapia with traditional systems and artificial feed that is integrated with other livestock has the potential to cause the danger of transmitting zoonotic pathogens from other livestock manure and feed residue. *Salmonella sp.* which is one of the zoonotic pathogens that can be transmitted from tilapia. The use of antibiotics in livestock and cultivation causes *Salmonella sp.* able to withstand some antibiotics. Salmonellosis in humans has become an important public health problem, incurring significant economic and medical costs worldwide. The incidence of salmonellosis due to fish consumption has become a concern of public health agencies in several countries, because increased consumption of fishery products, especially raw products, increases the risk. Pathogen exposure, especially in vulnerable groups, such as the elderly, has increased significantly. pregnant women and babies. The importance of this pathogen in fish can be assessed and evaluated, as records show that most *Salmonella* infections in humans are related to fish consumption.

**Keywords:** Tilapia fish, *Salmonella sp.*, Zoonotic pathogen, Public health

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## INTRODUCTION

Integrated tilapia farming is a traditional practice by small-scale farmers in China as well as in other Asian countries. Fish are usually raised in ponds with livestock units, such as pigs, located on pond embankments, which allow drainage of livestock manure and excess feed into the pond as plankton and other fish feed [1, 2]. Although integrated agricultural systems are sustainable in many ways, they represent potential food safety hazards, for example transmission of zoonotic pathogens from faeces and accumulation of antimicrobials and others. residues originating from pig manure and feed [3, 4]. Tilapia is one of the easiest to cultivate and trade fishery food products internationally in the world, with an estimated 1.45 million tonnes produced in China in 2013 [5, 6].

In the Asia-Pacific region, farmed fish are fed commercial or homemade feed [7]. Homemade feed is used to reduce costs and usually consists of chicken offal and by-products produced during poultry processing, kitchen waste, and other by-products from the food industry [7, 8]. Homemade diets can be a potential source of foodborne pathogens, particularly *Salmonella* bacteria [9, 10], which can then be transmitted to farmed fish [11] and to humans. Salmonellosis in humans has become an important public health problem, creating significant economic and medical costs worldwide. In the United States, nontyphoidal *Salmonella* caused approximately 1 million foodborne illnesses, 13,000 hospitalizations, and 242 deaths in 2011 [12]. In Taiwan, *Salmonella* is one of the most frequently isolated foodborne pathogenic bacteria [13]. *Salmonella* is usually transmitted to humans through consumption of

contaminated food products. According to Bean et al. [14], approximately 7% of cases of human salmonellosis result from ingestion of contaminated food from fishery products, particularly ready-to-eat (RTE) products. In Hong Kong, detected *Salmonella* in smoked fish, salmon sushi, and salted fish products [15, 16, 17], which illustrates that *Salmonella* was continuously contaminated by these RTE products. In addition, human salmonellosis caused by contaminated fish products has been reported in European countries [18, 19], where processing is considered to be one of the important sources of contamination [20, 21]. Martinez-Urtaza and Liebana [21] and Morris et al. [22], who evaluated the incidence of *Salmonella* in seafood processing plants, surveillance of foodborne pathogens during processing is essential to a successful contamination control program. When monitoring *Salmonella* contamination, serotyping and molecular subtypes are often applied to trace the source of bacterial contamination [23, 24].

The incidence of salmonellosis due to fish consumption has become a concern of public health agencies in several countries, because the increased consumption of fish farming, especially raw products, which increases the risk of exposure to pathogens, especially in vulnerable groups, such as the elderly, increases significantly. pregnant women and infants [25, 26]. The importance of this pathogen in fish can be assessed and evaluated, as records show that fish is the source of transmission responsible for 7% of total foodborne outbreaks in Europe in 2016, with the majority of *Salmonella* infections in humans linked to



fish consumption caused by *Salmonella* Typhimurium and Enteritidis serovars [27, 28, 29, 30].

#### Overview of *Salmonella* sp.

*Salmonella* spp. are Gram-negative rod-shaped bacteria that cause salmonellosis. In humans, these pathogenic bacteria cause enteric fever and acute gastroenteritis [31]. Symptoms include mild to severe gastroenteritis, with an incubation period of 6–72 hours [31]. Salmonellosis outbreaks due to fish consumption have been reported in several countries. For example, salmonellosis caused by eel consumption, which is linked to fish farming in Italy and has been reported in Germany [32]. Several reports have linked the presence of *Salmonella* spp. in various fishes and shell fishes [33, 34]. Various hazards associated with natural fish farming come from the environment or from human or animal activities. Fish can be a vehicle for transmission of *Salmonella* which can be pathogenic for humans and has a high potential to transmit its antibiotic resistance gene to other pathogens via plasmids [35]. The potential for antibacterial agents to cause the development of resistance in fish pathogens is of worldwide concern [36].

*Salmonella* grows optimally at 37 °C, but these bacteria are able to grow in a temperature range of 5–47 °C [37]. However, dietary *Salmonella* exhibits varying survival behavior depending on the type of food matrix and storage conditions [37]. Studies show that *Salmonella* can survive for more than 16 weeks in frozen processed chicken products and for more than 9 months in frozen beef without much change in quantity [37]. Studies on the viability of *Salmonella* in chilled and frozen fish and fishery products are very limited. One study reported that *Salmonella* Enteritidis survived but did not grow at 3 °C, whereas bacteria thrived at 10 °C in vacuum packed fish and poultry [38]. The amount of *Salmonella* in raw tuna was reduced by 1 to 2 logs after 12 days of storage at 5–7 °C, whereas in frozen storage *Salmonella* became undetectable after 42 days of storage. In frozen shrimp, populations of *S. Weltevreden* and *S. Senftenberg* decreased but were not eliminated during 12 weeks of storage [39, 40].

#### Zoonoses in humans

Infection can occur if fishery food contaminated with salmonella is consumed raw or undercooked. Salmonellosis transmitted through food from fisheries is a major cause of human morbidity worldwide [40, 41]. *Salmonella* spp. cause various diseases such as enteric fever and gastroenteritis. The majority of the estimated 1.3 billion annual cases of salmonellosis result from consumption of contaminated food products especially pork, poultry, eggs and vegetables [41]. In comparison, fishery foods are less frequently associated with *Salmonella* infections although reports from Thailand, Malaysia and other Asian countries indicate that certain serovars, eg *S. Weltevreden*, may be primarily associated with aquatic environments and seafood [42]. Prevalence of *Salmonella* spp. may also be higher in seafood from Asia compared to seafood from other geographic regions [43, 44]. However, other studies argue that *Salmonella* spp. can last longer in tropical aquatic environments and should therefore be seen as part of the normal micro-flora of aquaculture products of the area [45]. *Salmonella* can be disseminated as a result of water currents, underground springs and rainwater runoff carrying contaminated material [46–49]. Like *E. coli*, *Salmonella* is continuously released into the environment from infected humans, livestock, domestic animals, and wildlife [50]. Pathogenic and potentially pathogenic bacteria associated with fish

and shellfish include *Mycobacteria*, *Streptococcus iniae*, *Vibrio vulnificus*, *Vibrio* spp, *Aeromonads*, *Salmonella* spp, *Shigella* and others [51, 52, 53]. Human infection by these fish pathogens is usually through contact with infected fish during handling, water or other elements of the fish's living environment [54]. The initial microflora on the surface of the fish is directly related to the aquatic environment whereas the flora in the digestive tract is related to the type of food and condition of the fish [55]. *Salmonella* sp. is a causative agent of pathological diseases in humans, cattle, poultry and other livestock and *Salmonella* infection is a major cause of concern for humans, animals and the food industry. Characterization of more than 2,500 *Salmonella* serovars, the pathogen infects nearly all vertebrates but the severity of infection varies from one serovar to another depending on the specificity of the host [56]. Some *Salmonella* serovars are limited to one or several hosts while others have a wide spectrum of hosts. An understanding of the mechanisms involving host preference by one serovar over another is essential. This is used to increase our knowledge about host adaptability and will be instrumental in designing better prevention models. Methods involving identification of genetic markers for host specificity will prove to play a role in determining virulence factors for other bacterial pathogens that cause systemic infection [54, 56].

The low standard of health in the coastal areas increases the eutrophication process, thus creating a broad conducive environment for the survival of microbes that eventually infect fish. Analysis of fish tissue slurry showed that the fish harvested from the landing beaches along the coast that had been contaminated by Enterobacteriaceae were; *Salmonella*, *Shigella* and *E. coli* [57, 58, 59]. In the Asia-Pacific region, farmed fish are fed commercial or homemade feed [60]. Homemade feed is used to reduce costs and usually consists of chicken offal and byproducts produced during poultry processing, kitchen waste, and other by-products from the food industry [60, 61]. Homemade diets can be a potential source of foodborne pathogens, particularly *Salmonella* bacteria [9, 62], which can then be transmitted to farmed fish [63, 64] and, in turn, to humans. Detailed information on salmonellosis due to consumption of tilapia in Malaysia is lacking, as most cases of food poisoning are not reported to the authorities. However, the Malaysian National Public Health Laboratory reports that the five most common nontyphoidal *Salmonella* serovars are *Salmonella* Enteritidis, *Salmonella* Weltevreden, *Salmonella* Corvallis, *Salmonella* Typhimurium, and *Salmonella* Tshiongwe [65]. In Malaysia, freshwater fish are kept using aquaculture ponds, ex-mining ponds, freshwater cages, cement tanks, canvas tanks, and freshwater cage culture systems. Most of the freshwater cultivated fish are maintained using the aquaculture system (59.5%) and ex-mining ponds (25%). Catfish (58.1%) and tilapia (41.3%) were reared in ground ponds and ex-mining [65].

#### Transmission of bacteria from tilapia (*Oreochromis* sp.)

Fish is considered to be one of the most nutritious and highly desirable food ingredients due to its high nutritional value and is rich in protein, vitamins and unsaturated fatty acids. Fish contains n-3 polyunsaturated fatty acids which is a very important aspect for health-conscious people especially in affluent countries where the death rate from cardiovascular disease is high. Fish contains more easily digestible protein than protein found from other sources. Fish are of great concern for export

earnings because of their higher nutritional value, low cholesterol levels and presence of essential amino acids [64]. Bangladesh is the 5th in world aquaculture production, which accounted for half of the country's total fish production in 2015-2016 [65, 66]. This sector contributed 3.65% to GDP and 1.97% to foreign exchange earnings through exports [66]. It is the second largest export industry in Bangladesh and accounts for 2.5 percent of global shrimp production [66].

The main pathogens affecting cultivation include bacteria, fungi, viruses, and parasites [67-69]. Bacterial diseases have become a major concern for cultivation, especially with warm water temperatures [70]. Different bacterial species are reported to be pathogens against aquatic tilapia, including *Aeromonas hydrophila*, *Edwardsiella tarda*, *Flavobacterium columnare*, *Francisella* spp., *Yersinia ruckeri*, *Staphylococcus epidermidis*, *Vibrio vulnificus*, and *Streptococcus agalactiae* [71-79].

Fish was associated with 24% of foodborne disease outbreaks and 6% of all food poisoning, or foodborne illness [80]. Levels of pathogenic bacteria in tilapia are related to the environment and its handling before entering food markets and restaurants. The bacteria associated with tilapia fish can be transmitted by direct contact and cause foodborne illness. For example, handling of tilapia has been linked to an outbreak of *Vibrio vulnificus* in a Seattle supermarket [81]. Other foodborne pathogenic bacteria including *Salmonella enterica*, enteropathogenic *Escherichia coli*, *Listeria monocytogenes*, *Yersinia enterocolitica*, and *Klebsiella pneumoniae* were identified from fresh tilapia in the Kenyan freshwater fish chain [82]. Shigatoxigenic and enteropathogenic *Escherichia coli* was isolated from farmed tilapia (*Oreochromis niloticus*) in the northeast region of the state of Sao Paulo [83]. It was reported that the microbial quality of tilapia showed that all the tissues were contaminated by salmonella and fecal coli. *Salmonella* can spread as a result of water currents, underground springs and rain runoff carrying contaminated material [84, 85]. Human infection by these fish pathogens is usually through contact with infected fish while handling them over, water or other elements of the fish's living environment [86]. These pathogenic organisms have been isolated from freshwater fish such as *Tilapia nilotica* Linn [87]. *Tilapia* is an important aquaculture production for food supply. Because on a global scale, fish and fish products are the most important sources of protein and it is estimated that more than 30% of the fish consumed by humans comes from aquaculture [88, 89].

Safe consumption of fish and fishery products requires adequate sanitary conditions from harvest to consumption [90, 91]. Consumption of fish and shellfish can also cause illness due to infection or poisoning. Most of the foodborne diseases are caused by *Salmonella* spp., *Staphylococcus* spp. and *Escherichia coli*, usually associated with the consumption of fish infected with these bacterial species especially *Salmonella* and *E. coli* [92, 93]. *Salmonella* usually enters the human intestine with food, *Salmonella* spp. must overcome resistance to colonization mediated by the gut microbiota and the innate immune system. *Salmonella* by inducing inflammation and innate immune defense mechanisms. Many models have been developed to study *Salmonella* spp. interactions with the microbiota have helped to identify the factors needed to overcome colonization resistance and to mediate disease [10, 54, 93]. *Salmonella* infection in humans mainly includes typhoid fever and this infection, known as enteric fever, continues

to be one of the most serious public health problems worldwide. The presence of higher levels of *Salmonella* in fish causes several symptoms in the human body such as diarrhea, nausea, vomiting and abdominal pain. Human salmonellosis caused by contaminated fish products has been reported in European countries [18, 19], where processing is considered to be one of the important sources of contamination [20, 21].

#### ANTIBIOTIC RESISTANCE

Self-limiting gastroenteritis is the main clinical picture developed by *Salmonella*, which in severe cases may require fluid and electrolyte replacement. The use of antibiotics is reserved for patients with serious illness or a high risk of invasive disease [94]. The antibiotic therapy scheme for typhoid fever includes third generation cephalosporin antibiotics, quinolones and macrolides. However, recently it has developed between typhoid *Salmonellas* and non-typhoid strains with a high degree of resistance to quinolones and cephalosporins [95]. The emergence of several drugs resistant to *Salmonella* (MDR) is currently of worldwide concern, and the occurrence of *Salmonella* MDR in food is a risk condition, indicating an increase in the severity of foodborne disease, leading to increased hospitalization rates and the likelihood of death [96]. In contrast, the epidemiology of antimicrobial resistance of *Salmonella* spp. It is complex and can be influenced by factors such as: consumption of antibiotics, human travel, transmission between patients in hospitals, import and trade in food of animal origin or not, trade in live animals within the country or between countries and exposure through animals or the environment human [97].

The use of antibiotics for therapeutics and growth promoters in feed animals has shown that the main factor for the emergence of resistant isolates [98], has been reported from livestock [99-103], poultry [104-108], pets [109-112], fish [113-116], and from animal products. [117-120]. Several studies have reported that pet food, meat, milk and fishery products contaminated by a multi-resistant *S. aureus* strain which has been one of the common causes of severe nosocomial infection for a long time [121]. In contrast, a large number of studies have reported increased incidence of resistance among *Salmonella* spp. isolated from poultry, beef and fishery products [122].

Antibiotics are used for medicinal purposes and as growth promoters in livestock and aquaculture leading to the development of resistance [123]. Acquired resistance to tetracyclines and chloramphenicol has been associated with extensive use of antibiotics in aquaculture in several Asian countries [124]. Sapkota et al. [125] reported that of the top 13 aquaculture producing countries, 92% used oxytetracycline and 69% used chloramphenicol.

It was reported that antibiotic resistance in Gram-negative bacteria from pond culture was higher in ponds undergoing antimicrobial therapy or with a recent history of treatment than in ponds without antimicrobial treatment recently [126, 127]. In a previous study, it was reported that all *S. enteritidis* strains isolated from tilapia sold in a wet market in Selangor, Malaysia were susceptible to rifampin. The emergence of *Salmonella* serovars with high MAR index indicates that these serovars originate from environments where antimicrobials are often used as therapy or as growth promoters in animal feed [128, 129]. Some drug-resistant *Salmonella* isolates have been suggested to be more virulent than non-multiple drug-resistant *Salmonella*

isolates [130]. *Salmonella* resistance to one or more antibiotics has been reported by many investigators [131]. Horizontal transfer of resistance genes in plasmids has been shown between bacteria in fish pond water [131] and in marine sediments [132]. Plasmids in *Salmonella* spp. has been reported to transfer antibiotic resistance and virulence properties [35].

### CONCLUSION

The presence of higher levels of *Salmonella* sp in tilapia fish causes several symptoms in the human health such as diarrhea, nausea, vomiting and abdominal pain. *Salmonella* sp in tilapia obtained from the decay of animal waste and feed residue during the traditional cultivation process. *Salmonella* sp is often resistant to several antibiotics which allow it to be transferred to the surrounding environment, which is because in the process of tilapia pond cultivation it is mixed with disposal from livestock waste where there is a lot of antibiotic residue and while cultivation is still using antibiotics. This is what needs to be a public health concern about antibiotic resistance from isolates obtained in tilapia fish.

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