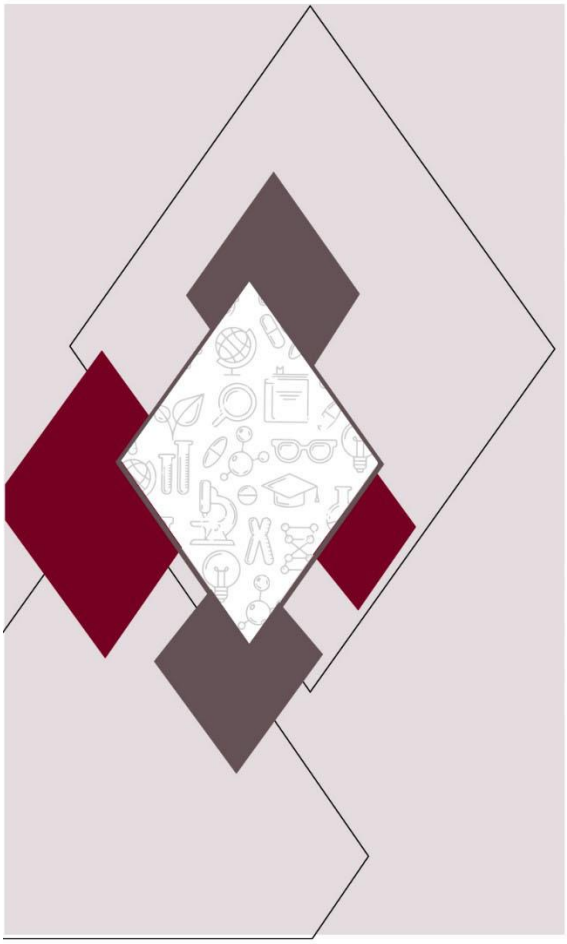
المجلة العربية للنشر العلمي

Arab Journal For Scientific Publishing



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مجلة علمية محكمة

مجلة شهرية الإصدار، دولية، دورية

تعنى بالدراسات متعددة التخصصات في اللغة العربية، والإنجليزية

عدد خاص لمداخلات

مؤتمر العلوم الطبيعية والتطبيقية الدولي الحادي عشر

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المجلة العربية للنشر العلمي

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المجلة العربية للنشر العلمي

Arab Journal for Scientific Publishing

مجلة علمية دولية محكمة ومفهرسة تصدر بشكل دوري شهري من مركز رماح الأردن للموارد البشرية، تعنى بالدراسات المختلفة سواء الأدبية أو العلمية بإشراف هيئة تحرير ولجنة تحكيم المشكلة من أساتذة جامعين وباحثين من أصحاب الشهادات العليا.

تهدف المجلة العربية للنشر العلمي لأن تكون عونا للباحثين العرب، لتساعدهم على نشر الأبحاث والدراسات العلمية وتسليط الضوء على البحث العلمي ومساعدة الباحثين على توفير مركز بحث علمي لنشر بحوثهم في كافة المجالات سواء باللغة العربية أو الإنجليزية.

الضوابط الشكلية للنشر في المجلة العربية للنشر العلمي:

1- نشر البحوث العلمية الأصيلة.

2- أن لا تكون البحوث قد نشرت مسبقاً في مكان آخر، وأن يتعهد صاحبها بعدم إرسالها إلى أية جهة أخرى.

3- تقبل البحوث بإحدى اللغتين العربية أو الإنجليزية

4- يقدم البحث عن طريق البريد الالكتروني للمجلة: submit@ajsp.net بالمواصفات التالية:

أ. تكون الهوامش من كافة الاتجاهات 2.5 سم.

ب. يكتب عنوان البحث بين علامتين تنصيص هكذا" ----- "

ج. يكتب العنوان بخط حجم 16 معBold ويجب أن يكون العنوان دقيقاً ومعبّراً عن محتوى البحث.

د. حجم الخط 12 (Simplified Arabic \ للنصوص العربية) 10 (Time New Roman \ للنصوص الانجليزية).

هـ . يرافق مع البحث ملخصان ، باللغتين العربية والإنجليزية، بما لا يزيد على 300 كلمة لكل منهما. و. أن لا تزيد عدد الصفحات البحث بما فيها الأشكال والرسوم والملاحق على (30) صفحة، وأن لا يتجاوز عدد الكلمات 10000 كلمة.

ز. ان يحتوي البحث على اسم الباحث (الباحثين) وعنوان جهة الباحث وعنوانه الالكتروني.

ح. الثوثيق : تعتمد المجلة نظام (American Psychological Association APA) للنشر العلمي.

5- يراعى أن تكون الأشكال والرسوم التوضيحية والصور الفوتوغرافية والخرائط واضحة المعالم والأسماء.

6- تعطى صفحات البحث بما فيه صفحات الرسوم والملاحق والجداول والهوامش أرقاماً متسلسلة من أول البحث إلى آخر البحث.

7- يكون عناوين الاشكال والجداول بلون غامقBold .

8- يرفق مع البحث ما لا يزيد عن 6 كلمات مفتاحية (دالة) خاصة به، وتكون باللغتين العربية والإنجليزية.

9- ان تكون المسافة بين السطور 1.0 واالهوامش 2.5 .

10- الأجزاء الواجب تغطيتها في الأبحاث العلمية المقدمة للمجلة العربية للنشر العلمي:

أ ملخص البحث (باللغة العربية) + مصطلحات البحث

ب مقدمة البحث

ج. مشكلة الدراسة

د. فرضيات الدراسة

هـ. أهداف الدراسة

و. أهمية الدراسة

ز. حدود الدراسة

ح. مصطلحات الدراسة وتعريفاتها

ط. الإطار النظري والدراسات السابقة

ي. منهجية الدراسة

ك. أداة الدراسة (إن وجدت)

ل. النتائج والتوصيات والخاتمة

م. توثيق المراجع بنظامAPA

و. ملخص الدراسة (باللغة الإنجليزية)

تقيم جامعة جيهان/ دهوك بالشراكة مع

كلية الطب-جامعة تكريت و كلية الصيدلة- جامعة البصرة وكلية الطب البيطري- جامعة البصرة ونقابة المعلمين العراقيين و مركز أبن حيان للدراسات والأبحاث ومركز البحث وتطوير الموارد البشرية رماح/الاردن وجامعة القرآن الكريم وتأصيل العلوم/ السودان والجامعة الحديثة للإدارة والعلوم

Dubai

15-17 / 3 / 2022

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بعنوان:

مستقبل العلوم الطبيعية والتطبيقية:

الواقع والتحديات

International Conference of Neutral and Applied Science (ICNAS-11)

في مدينة دبي / الامارات العربية المتحدة

15 – 17 / 3 / 2022

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للمدة ١٥-١٧ / ٣ / ٢٠٢٢

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رئيس جامعة جيهان /دهوك

نائب رئيس المؤتمر

أ.م.د. عمار لطيف حسين

معاون عميد كلية الطب للشؤون العلمية/جامعة تكريت

الرئيس الشرفي للمؤتمر

أ.د. أبكر عبد البنات

مدير جامعة القرآن الكريم وتأصيل العلوم /السودان

المشرف العام على المؤتمر

أ.د. خالد راغب احمد الخطيب

رئيس مركز البحث وتطوير الموارد البشرية رماح /الأردن

مستشار المؤتمر

أ.م.د. عبدالله عبد شهاب

مركز أبن حيان للدراسات والأبحاث

مقرر المؤتمر

م. د. علي محسن علي صالح

كلية الطب – جامعة كربلاء / العراق

المجلات الراعية للمؤتمر

*** International Journal** مجلات عالمية

1- The Medical Journal of Tikrit University (MJOTU) **Published by** Tikrit University
ISSN: 1813-1638 (Print), **Language**: English, **Subjects**: Medicine (General)
Website Link: https://jcoagri.uobaghdad.edu.iq/index.php/intro/index

2- Teikyo Medical Journal – ISSN: 03875547
Website Link: **https://www.teikyomedicaljournal.com**
Acceptance: 10-28 days Publications: 30 days

3- Journal of Positive School Psychology (JPSP) – ISSN: 2717-7564
Website Link: https://journalppw.com/index.php/jpsp
Acceptance: 7 to 15 days, Publication: 45-60 days

4- Basrah Journal of Veterinary research (BAS.J.VET.RES) **Published by** College of Veterinary Medicine, University of Basrah, Iraq – Print ISSN:1813-8497 – OnlineISSN:2410-8456
Website Link: http://basjvet.org

* Scopus Journals مجلات عالمية

1- Mathematics and Statistics - ISSN: 2332-2071, E-ISSN: 2332-2144 - **Q4**

Subjects: Decision Sciences, Statistics, Probability and Uncertainty

Economics, Econometrics and Finance, Economics and Econometrics, Mathematics, Statistics and Probability

Journal Link: https://www.hrpub.org/journals/jour_info.php?id=34

Scopus Link: https://www.scopus.com/sourceid/21100905277

Fee: 450$

2- Journal of Physics: Conference Series - Print ISSN: 1742-6588, Online ISSN: 1742-6596 - **Q4**

Subjects: Physics, Astronomy, Mathematics and Multidisciplinary.

Website Link: https://iopscience.iop.org/journal/1742-6596

Scopus Link: https://www.scopus.com/sourceid/130053

Acceptance: 30 days. Publication: 45-60 days. Note: Plagiarism should be below 15%.

Fee: 500$

3- IRAQI JOURNAL OF AGRICULTURAL SCIENCES (IJAS) - Q3

The international number of IJAS are PISSN 0075-0530, EISSN 2410-0862

Digital Object Identifier (DOI) - 10.36103

Website Link: https://jcoagri.uobaghdad.edu.iq/index.php/intro/index

Scopus Link: https://www.scopus.com/sourceid/21100809798

Fee: 200$

4- Lecture Notes in Networks and Systems - ISSN: 2367-3370, E-ISSN: 2367-338

Subjects: Computer Science, Computer Networks and Communications, Signal Processing, Engineering, Control and Systems Engineering

Website Link: https://www.springer.com/series/15179

Scopus Link: https://www.scopus.com/sourceid/21100901469

5- AIP Conference Proceedings - ISSN: 0094-243, XE-ISSN: 1551-7616

Subjects: Physics and Astronomy (miscellaneous)

Website Link: https://aip.scitation.org/journal/apc

Scopus Link: https://www.scopus.com/sourceid/26916

6- Iranian Journal of War and Public Health- ISSN:2008-2622, E-ISSN:2008-2630 - Q4

Subjects: Medicine, Health Policy Medicine, Public Health, Environmental and Occupational Health.

Website Link: http://ijwph.ir

Scopus Link: https://www.scopus.com/sourceid/21100905904

Acceptance: 10-15 days, Publication: 45 days.

7- Turkish Journal of Physiotherapy and Rehabilitation - Web of Science (ESCI)-ISSN: 2651-4451 - Q4

Subjects: Health Professions, Physical Therapy, Sports Therapy and Rehabilitation, Medicine, Orthopedics and Sports Medicine, Rehabilitation.

Website Link: http://www.turkjphysiotherrehabil.org

Scopus Link: https://www.scopus.com/sourceid/21100893337

Acceptance: 2 to 3 Days, Publication: 5 to 7 days.

8- SPORT TK-Euro American Journal of Sport Sciences - ISSN: 2254-4070, E-ISSN: 2340-8812- Q4

Subjects: Health Professions, Occupational Therapy, Physical Therapy, Sports Therapy and Rehabilitation, Social Sciences, Education, Medicine, Orthopedics and Sports Medicine, Complementary and Manual Therapy.

Website Link: https://revistas.um.es/sportk/issue/view/19721

Scopus Link: https://www.scopus.com/sourceid/21101023086#tabs=2

Fast Track: Acceptance: 20 days, Publication: 60 days

ديباجة المؤتمر

- يُعدّ تقدم البحث العلمي ونتائجه علامة فارقة على تقدم الشعوب والأمم. وعلى ضوء ذلك لابد من البحث الجاد عن دعم خيارات التعليم العالي والسعي إلى النهوض به عن طريقها.
- خدمة المجتمع وهو هدف أساسي لجميع مؤسسات التعليم العالي. والذي يعمل على تطوير البحث العلمي ودعم الابتكار والمبتكرين فيه لمختلف الأختصاصات واحتواء أكبر عدد منهم، ودعم المميزين منهم.
- إن الاستثمار الحقيقي من المشاركة للمؤتمرات بين الدول العربية هو السبيل الأقوى لاستمرار التعليم العالي، ودعم تطوير المعرفة من خلال تطوير البحث العلمي والأهتمام به ودعمه، وبذلك تفتح أفاق التعاون بين جامعات الوطن العربي والعالم بالأضافة الى التعلم والتعليم عن بعد.

أهداف المؤتمر

يهدف المؤتمر الى الإرتقاء بالبحث العلمي لكافة الأختصاصات بالأضافة الى تشجيع طلبة الدراسات العليا على نشر نتائج الأبحاث العلمية والمقترحات التي يقدمونه لما لذلك من أهمية كبيرة لتنوع ثقافة البحث العلمي بين الباحثين وتطورالأفكارالعلمية لتسليط الضوء عليها ودراسة أمكانية الاستفادة من نتائجها. بجانب العمل على توفير البيئة الأكاديمية والإجتماعية الداعمة للإبداع والتميز

والإبتكار الذي يقع في قمة الأولويات لدعم الأساتذة الجامعيين والباحثين. وإننا بعقدنا هذا المؤتمر نأمل أن يعكس التفاؤل الضروري والروح البناءة الإيجابية اللازمة لمواجهة التحديات الصعبة التي تواجه الأرتقاء بالبحث العلمي المميزوعلى حد سواء في الوطن العربي، وأن ينشر مفهوم متابعة النتائج المستخلصة وتفعيل الأستفادة منها في مجالات الحياة المختلفة.

محاورالمؤتمر

اولا" : محاور العلوم الطبيعية الصرفة

1. **علوم الكيمياء**
2. **علوم الفيزياء**
3. **علوم الحياة**
4. **علوم الرياضيات والاحصاء**
5. **علوم الحاسوب وتكنولوجيا المعلومات**
6. **علوم الجيولوجيا**
7. **علوم البيئة والتلوث**
8. **علوم الزراعة**

ثانيا" : محاور العلوم الطبية

1- الطب العام (بكافة فروعه).

2- طب الأسنان (جراحة الفم والوجه والفكين، التقويم وطب الأسنان، أمراض الفم واللثة).

3- الصيدلة (الأدوية والسموم، الكيمياء الصيدلية، والتكنولوجيا الحيوية الصيدلية).

4- علوم التحليلات المرضية (الكيمياء الحيوية السريرية،الأحياء المجهرية، البايلوجي الجزيئي، المناعه السريرية، الهيماتولوجي).

5- تقنيات أحيائية (التكنولوجيا الطبية الحيوية، الهندسة الوراثية، بايولوجية الخلية، تقنيات الزراعة النسيجية، التقنيات الأحيائية البيئية، النانوتكنولوجي).

6- الطب البيطري (الباطني والوقائي، الجراحة وعلم تناسل الحيوان، الأمراض، الصحة العامة البيطرية، التشريح، الفسجلة).

ثالثا": محاور العلوم الهندسية

1- هندسة ميكانيك (هندسة سيارات، هندسة الطائرات، هندسة التكييف والتبريد، هندسة تحويل الطاقة، هندسة الانتائج والمعادن، هندسة تطبيقية).

2- الهندسة المدنية (هندسة البيئة، هندسة البناء والاستثمار، هندسة المساحة، هندسة المنشأت الهيدرولكية، هندسة الموارد المائية، هندسة الطرق والجسور).

3- هندسة الكهرباء (الالكترونيات، الأتصالات، الحاسوب، قدرة كهربائية).

4- الهندسة الكيميائية (معالجة المواد، توليف وتركيب المواد، البتروكيمياويات، الهندسة النووية).

4- هندسة العمارة وتخطيط المدن (التصميم الحضري، عمارة معاصرة، العمارة التقليدية المحلية، عمارة الفضاءات الخارجية،العمارة المستدامة، تخطيط مدن ، تخطيط بيئي، تخطيط مستدام، تخطيط نقل).

رابعا": علوم الرياضة

1. العلاج الطبيعي **الرياضي**
2. التربية **الرياضية** والبدنية

3. علم النفس الرياضي

4. التغذية الرياضية

خامسا": براءات الاختراع

معرض لبراءات الاختراع المسجلة في العشر سنوات الاخيرة وفي كافة الاختصاصات. يجب عرض شهادة براءة الاختراع مع الملخص.

اللجنة العلمية

رئيس اللجنة العلمية : أ.د. عبدالله صالح حسن علي / كلية الطب – جامعة الأنبار / العراق

مقرر اللجنة العلمية : م. د. علي محسن علي صالح / كلية الطب – جامعة كربلاء / العراق

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شروط المشاركة

1-يخضع البحث للأستلال قبل استلامه من الباحث.

2- أن يكون البحث جديداً في مجاله غير مشارك في مؤتمر سابقا أو منشور في مجلة علمية محكمة.

3-أن يخضع البحث للتحكيم ويقبل أو يرفض أو يعدل حسب قرار المحكمين وعلى الباحث الالتزام بهذه القرارات.

4- أن يرسل ملخص البحث بما لا يزيد عن 250 كلمة.

5- أن يقدم البحث بعد شهر من مناقشته في المؤتمر.

6- يتعهد الباحث في نشر بحثه ضمن المجلات الراعية للمؤتمر وبعدد خاص ضمن وقائع المؤتمر.

7- أن يخضع البحث للرصانة العلمية وحسب شروط النشر في المجلة العلمية التي سينشر بها البحث.

أمتيازات المشاركة في المؤتمر

- المشاركة الحضورية مع النشر(حقيبة المؤتمر، القرطاسية، جميع شهادات المؤتمر، الضيافة).
- المشاركة الافتراضية مع النشر (جميع شهادات المؤتمر).
- المشاركة الحضورية في المؤتمر بدون نشر (حقيبة المؤتمر، شهادة مشاركة، شهادة حضور، شكر وتقدير).
- المشاركة الافتراضية في المؤتمر بدون نشر (شهادة مشاركة، شكر وتقدير).
- شهادات المؤتمر تشمل (شهادة مشاركة، شهادة النشر، شهادة حضور، شكر وتقدير).

أجورالمشاركة

- أجور المشاركة الحضورية في المؤتمرللباحث المشارك منفردا: 250 $.
- أجور المشاركة للبحث المشترك: 150 $.
- أجور المشاركة الافتراضية عن بعد: 150 $.
- أجور المرافق للباحث: 150 $.
- النشر في مجلات سكوبس حسب تكاليف مستوى المجلة.

- لا تشمل الأجور أعلاه الفيزا والسفر والسكن تشمل الأجور شهادة المؤتمر + حقيبة المؤتمر + نشرالبحث +الضيافة.

مواعيد مهمة

موعد أنعقاد المؤتمر 15-2022/03/17 م

اخر موعد لاستلام الملخصات 2022/03/1

اخر موعد لاستلام البحوث كاملة بعد شهر من انعقاد المؤتمر لاعطاء فرصة للباحثين للاستفادة من ملاحظات المناقشة وتعديل البحوث من قبل الباحث بعد الأخذ بالملاحظات التي تطرح في المناقشة

تنشر البحوث حسب مواعيد المجلات

ترسل البحوث باللغة الانكليزية لمن يرغب بالنشر في مجلات مستوعبات سكوبس

أستمارة المشاركة

الاسم الثلاثي:

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الجنسية:

.....

مكان العمل الحالي:

.....

المؤهل العلمي:

.....

هاتف العمل:

.....

خلوي:

.....

فاكس:

.....

البريد الإلكتروني .... :

.....

نوع المشاركة ○ **بحث** ○ **حضور**

عنوان البحث:

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محور البحث :

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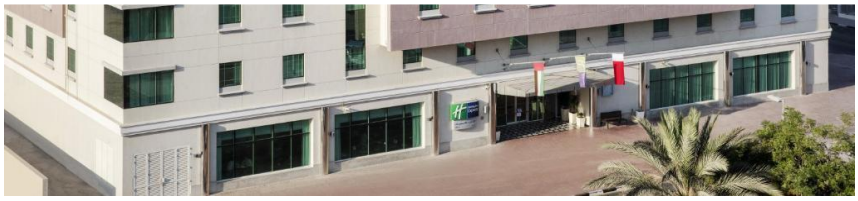
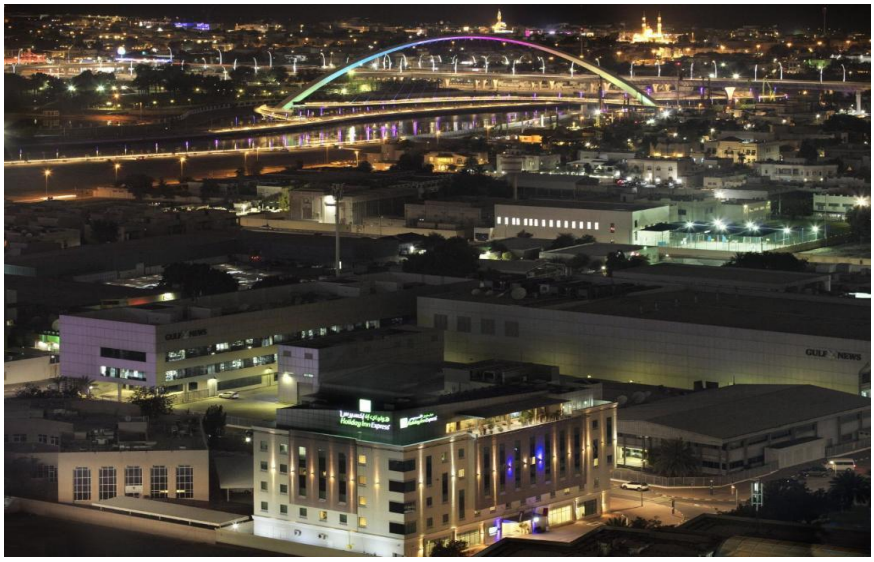
التوقيع:

مكان انعقاد المؤتمر

Holiday Inn Express Dubai Safa Park, an IHG Hotel





2022

مؤتمر العلوم الطبيعية والتطبيقية الدولي

11 الحادي عشر

فهرس الأبحاث لـمؤتمر مؤتمر العلوم الطبيعية والتطبيقية الدولي الحادي عشر

رقم البحث	عنوان البحث	اسم المؤلف
.1	"Biological Activities of Klebsiella Pneumoniae Lipopolysaccharide Coating by ZnO-nanoparticles"	-Fatima S. Abdel Razak -Neihaya H. Zaki -Ikbal Kh. Aljoofy
.2	Does Brain or Renal Expression of KRAS be influenced by " "?Silver-Nanoparticles	-Mohammed Ayyed Najm -Gulboy Abdolmajeed Nasir -Huda Musleh Mahmood
.3	"A comparative study the effects of Ganoderma lucidum and Metformin on histological and biochemical characteristics in diabetic rats"	-Nahidah Ibrahim Hammadi
.4	"استخدام التحليل العاملي الاستكشافي والتوكيدي لتحديد أهم العوامل المؤثرة في فاقد ما بعد الحصاد للمحاصيل البستانية في العراق (اشجار اللالنكي والنارنج انموذج تطبيقي للبحث)"	-سعاد حسين علي -زحل رضيوي كاظم -شيماء علي كاظم -اسماء طارق البلداوي
.5	"تحولات النظام الرأسمالي من الكلاسيكية الى الكينزية بين الأسباب وعوامل الإستمرار في العصر الحديث"	-م. د مليحة جبار عبد الكعبي
.6	"قياس الكفاءة التقنية باستخدام التحليل الحدودي العشوائي SFA لمزارع الشعير في محافظة واسط / العراق"	-حوراء جعفر محمد -اسكندر حسين علي -قيس طامي جسام
.7	"Effect of urinary tract infections with Klebsiella pneumoniae on some immunological variables for patients admitted to Ramadi General Hospital"	-Najeeb Mohammed Hussein -Reem K. Ibrahim -Noor Mohammed Hussein -Lina Adnan Obeis
.8	"The role of different mutations and recombination in genome lead to modify proteins enveloped and spikes among corona viruses"	-Israa Hussein Hamzah -Noor Al-Huda Ali A.H Saeed -Suhad Abbas Abid -Israa M.S. Al-Kadmy
.9	"Multiple Models to Predict the Number of Cases of Covid-19 Patients in Baghdad"	-Lamyaa Mohammed Ali Hameed -Rabab Abdulrida Saleh
.10	"Effective of CBD and THC extracted from Cannabis Sativa on kidney health in the experimental mice"	-Omar Almuharib -FIRAS NAJM ISMAEL -Sara Thamer Hadi
.11	"Association between ABO blood group, TNF-α and Acinetobacter baumannii in a sample of Iraqi patients"	Sahar Manfi Ahmed, Kadhim Hashim Yaseen, Majid Mohammed Mahmood, Esraa Fuad Abd-Ali
.12	"Study of some vital components and some antioxidants in Alzahdi date seeds powder"	M. A. H. Morgab I. F. Kasar A. D. Hussein
.13	"Studying the Effect of Fungal keratitis on some Physiological and Immunological Variables"	Wijdan Ahmed Ali, Hebat-Alla A. A. Alhamdani, Noor Talib Khaleel

المجلة العربية للنشر العلمي

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عدد خاص / مؤتمر العلوم الطبيعية والتطبيقية الدولي الحادي عشر

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"Biological Activities of *Klebsiella Pneumoniae* Lipopolysaccharide Coating by ZnO-nanoparticles"

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Abstract:

The biological effects of Lipopolysaccharide adsorption on the Nanoparticles surface on the formation of harmful bacterial biofilms were investigated in this work. One hundred isolates of *K. pneumoniae* were isolated from different medical sources and showed different degrees of resistance rate towards the antibiotics. ZnO-NPs were incubated with different concentrations of *K. pneumoniae* LPS, and a discrete shift of the peak of the UV-VIS spectrum with few nanometers was observed, which indicates the binding of LPS to the ZnO-NPs surface. To further confirm that LPS can attach to the surface of 17.3 nm ZnO- NPs, FTIR analysis was used to compare the materials before and after binding. The presence of LPS on the NP surface stabilized them, as they did not aggregate after the washing, and these results confirm that the endotoxin is adsorbed on the surface of ZnO-NPs. The highest antibacterial activity was observed with LPS- ZnO NPs and showed a high inhibition zone (31.8 mm) against *K. pneumoniae*. Also, LPS- ZnO NPs were able to decrease biofilm formation of pathogenic bacterial isolates, and the higher inhibition percentage of biofilm is found for *P. aeruginosa* (95 %), compared with ZnO NPs (54.4%) and LPS (44.96%). Results of cytotoxicity showed that LPS- ZnO NPs in concentration (400, 200, 100, 50, 25) µg / ml did not show the significant effect of viability rate on normal WRL 68 cell line, while ZnO NPs and LPS in the same concentration showed the low effect to WRL 68 cells.

Keywords: ***Klebsiella pneumoniae***, **lipopolysaccharide, LPS-ZnONPs, Antibacterial, Antibiofilm.**

Introduction:

Klebsiella pneumoniae is one of the leading pathogens in the world, causing a wide variety of infectious diseases. It is a Gram-negative opportunistic bacterium that causes infections in hospitalized or otherwise immunocompromised individuals (Gorrie *et al.*, 2017). *Klebsiella pneumoniae* is an important cause of pneumonia, urinary tract infections, septicemia, and intra-abdominal infections (Gupta,2002).

Its non-motile, facultative anaerobic rods ranging from 0.6-6.0 µm in length to 0.3 - 1.0 µm in width *Klebsiella* species show mucoid growth because of the presence of large polysaccharide capsules and they generally give positive test results for lysine decarboxylase

and citrate (Carroll *et al*., 2016). Members of the genus *Klebsiella* are present universally in nature including animals, humans, and plants. *K. pneumoniae* is due to the presence of many virulence genes which encode virulence factors that allow it to attack the immune system of mammalians and cause many kinds of diseases. Some of these virulence factors are biofilm formation, hyper muco-viscosity, capsule synthesis, adhesions, iron uptake, and lipopolysaccharides formation (Hennequin and Robin,2016).

Lipopolysaccharides are found in the outer membranes of most Gram-negative bacteria, large, heat-stable molecules (molecular weight: 200 to 1000 kDa) typically consist of a hydrophobic domain known as lipid A (or endotoxin) responsible for their toxicity, a non-repeating core oligosaccharide, and a distal polysaccharide (or O-antigen). lipopolysaccharide plays a principal role in the activation of the inflammatory response (Tan and. Kagan, 2014). LPS are pathogen-associated molecular patterns (PAMPs) acting as strong macrophage activators, and their effects range from airway disease to fever, septic shock, and hypotension depending on the administration route and dosage (Gangloff, 2012).

Nanoparticles are a part of nanomaterials which are defined as a single particle (1–100) nm in diameter. Nanoparticles have been a common material for the development of new cutting-edge applications in communications, sensing, energy storage, data storage, environmental protection, transmission, optics, cosmetics, biology, and medicine owing to their important optical, electrical, and magnetic properties (Ju-Nam, 2008).

Zinc oxide nanoparticle is one inorganic metal oxide it can safely be used as medicine, an antimicrobial agent, and preservative in the packaging (Jiang *et al*, 2018). It easily diffuses into the food material kills the microbes. Zinc oxide nanoparticles are antibacterial and inhibit the growth of microorganisms by permeating into the cell membrane. The oxidative stress damages lipids, proteins, carbohydrates, proteins, and DNA (Madhumitha *et al*, 2016). Lipid peroxidation is obviously the most crucial that leads to alteration in the cell membrane which eventually disrupts vital cellular functions (Mikrajuddin *et al*, 2002). However, for bulk zinc oxide suspension, external generation of H_2O_2 has been suggested to describe the anti-bacterial properties (Sharma., *et al* 2016). So, this study aimed to bind zinc oxide nanoparticles to the lipopolysaccharide and determine the toxicity of LPS-Coated ZnO NPs in vitro, and then study the antibacterial and antibiofilm activities of the LPS-ZnO NPs complex.

Material and Methods

Chemicals

ZnO-NPs powder (Chemondis, Germany) was purchased from a local medical shop in Baghdad- Iraq, Normal cell lines (WRL68) were obtained from Malaysia labs, and antibiotics were bought from Bioanalyse company- Turkey.

Isolation and identification of *Klebsiella pneumoniae*

About 150 samples were collected from blood, burn, urine, sputum, wound, lung fluid, urine catheter, pus, and ear swabs in sterilized containers from different hospitals in Baghdad city- Iraq. Nutrient agar and MacConkey agar (HI media company- India) were used for cultivation and incubated at 37 C for 24h. Vitec system was used to confirm the identification of bacteria.

Pathogenic isolates

The test pathogenic isolates (*Pseudomonas aeroginosa, Acinetobacter baumannii, Escherichia coli, Staphylococcus aureus, Staphylococcus epidermidis, Klebsiella pneumoniae, and Candida albicans)* were obtained from the post-graduate lab. in the Department of Biology- College of Science- Mustansiriyah University, and used in antibacterial and antibiofilm tests.

Antibiotic-Resistant Test

Antibiotic-resistant test towards eight different antibiotics (amikacin, ceftazidime, ceftriaxone, ciprofloxacin, gentamycin, piperacillin, aztreonam, and imipenem) was done by the Kirby-Bauer method. Colonies from an overnight nutrient agar plate culture were transferred to a tube containing 3 ml of normal saline. The turbidity was adjusted to 0.5 McFarland tube equal to 1.5×10^{8} CFU/ml. A sterile cotton swab was dipped into the bacterial suspension; excess fluid

was removed by pressing the swab against the tube wall. The bacterial suspension was inoculated into Mueller-Hinton agar plates and the plates were left to dry for 10 min. The antibiotic discs were placed on the surface of the medium using sterilized forceps and the plates were incubated at 37°C for 24 hr. using a metric ruler and compared with the Clinical Laboratory Standards Institute (CLSI, 2016) and recorded as susceptible (S), resistant (R) and intermediate (I).

Extraction of *Klebsiella pneumoniae* lipopolysaccharide

The LPS was extracted by a hot phenol-water method as described by (Galanoso *et al.*, 1969) with some modifications. In brief, bacterial suspensions (10^8 colony-forming units/ mL) were centrifuged at 10,000×g for 5 min. The pellets were washed twice using PBS (0.15 M, pH=7.2) containing 0.15 mM CaCl2 and 0.5 mM MgCl2. Pellets were then resuspended in 10 ml PBS and sonicated for 10 min on ice. The mixture was subsequently treated with 1 µL/mL 20% MgSO4 and 4 µL/mL chloroform and incubation was continued at 37°C overnight. At the next step, an equal volume of hot (65-70°C) 90% phenol was added to the mixtures followed by vigorous shaking at 65-70°C for 15 min. Suspensions were then cooled on ice, transferred to 1.5 ml tubes, and centrifuged at 8500×g for 15 min. Supernatants were transferred to 15 mL conical centrifuge tubes and phenol phases were re-extracted by 300 µL distilled water. Sodium acetate at 0.5 M final concentration and 10 volumes of 95% ethanol were added to the extracts and samples were stored at -20°C overnight to precipitate LPS. Tubes were then centrifuged at 2000×g 4°C for 10 min and the pellets were resuspended in 1 ml distilled water. Extensive dialysis against double distilled water at 4°C was carried out at the next step until the residual phenol in the aqueous phases was eliminated. The final purified LPS product was stored at 4°C.

Purification of lipopolysaccharide

Partial Purification of LPS by Gel Filtration (Sephacryl S−300) which was primed according to the information of the manufacturer company (Sigma, Germany). It was washed and suspended in 0.025 M of phosphate buffer (pH 7.2), degassed by utilizing a vacuum pump then poured with care to avoid bubbles into a column with a measurement of 75×2 cm. The last volume of the column was 235.5 cm3, then the column was equilibrated with 0.025 M of phosphate buffer saline (pH 7.2), and the stream rate was 75 ml/hour (Ruaa, *et.al*. 2019).

Binding of ZnO−nanoparticles with lipopolysaccharide

One ml of the ZnO−nanoparticles (3.5×10^5 NPs/ml) was incubated overnight at 4 °C with 5 µg of *K. pneumoniae* LPS. The excess of un bouned LPS was removed by three washing steps (5 min at 18000 rpm), then incubated over time (up to 1 week) at 4 °C. The next step is collected at (14000 × g for 10 min) and washed with endotoxin−free water to eliminate unbound LPS (Yang *et al*., 2017).

Characterization of LPS, NPs, and LPS− ZnO−NPs

Characteristics of these materials were evaluated by UV−VIS, FTIR, SEM, XRD, Zeta potential, and TEM before and after exposure to LPS. Scanning electron microscopy (SEM) analysis was performed on JEOL Model JSM−6390LV, UV− absorbance spectra were measured by UV− visible spectroscopy at the wavelength range between 200 to1100 nm, while X−ray Diffraction (XRD) was performed using X−ray Diffractometer (Bruker, Germany). Characterization involved by FTIR (IR Affinity−1, Shimadzu, Japan) analysis of the dried powder of ZnO NPs in the range between 400 to 4000 cm^{-1}.

Antibacterial activity of LPS–ZnO NPs

The well diffusion agar assay was applied to assess the antibacterial activity of LPS- ZnO NPs, LPS, and ZnO NPs on bacterial species (*Staphylococcus aureus, Staphylococcus epidermides, E. coli, Klebsiella pneumoniae, and Candida albicans*) as described in (Eltarahony, *et.al*. 2018). A single colony was grown overnight in Nutrient broth for bacterial inoculum preparation, and turbidity was adjusted to 0.5 McFarland standards. Mueller-Hinton agar plates were swabbed with 0.1 ml of each culture suspension, and NPs (100 and 200 µg/ml) were impregnated to a center well with a diameter of 8 mm. The plates were incubated at 37° C for 24 hr. The zone of inhibition was measured by subtracting the well diameter from the total inhibition zone diameter and expressed in millimeters. The antibacterial activity of antibiotics (rifamycin, streptomycin, and tetracycline) was examined as a control.

Antibiofilm activity of LPS–ZnO NPs

The antibiofilm activity of the LPS- ZnO nanoparticles against pathogenic bacterial isolates was determined by the procedure described by (AL–Sudani, 2018) with modification. Each of the bacterial suspension in the brain heart infusion broth with 2% sucrose (100µl) was added to 96 well flat-bottomed microtiter plate together with 100µl of sub-MIC of ZnO nanoparticles, 100µl of LPS, and 100µl of LPS- ZnO nanoparticles. Control wells contained 180 µl of brain heart infusion broth with 2% sucrose and 20 µl of the bacterial suspension. The covered microtiter plate was sealed with parafilm during incubation at 37°C for 24 and 48 hr. Un-attached bacterial cells were removed by washing the wells three times with PBS (PH 7.2).

After drying at room temperature, 200 µl of crystal violet (0.1%) was added to the wells for 20 min. The stained attached bacterial cells were rinsed three times with PBS (PH 7. 2), allowed to dry at room temperature then extracted twice with 200 µl of 95% ethanol, and the

absorbance of each well was measured at 630 nm using an ELISA reader. The inhibition of biofilm formation of each pathogenic bacterium was calculated in the equation described by (Namasivayam *et al.* 2013).

$$\% \text{ Inhibition of biofilm formation} = \frac{OD\ control - DO\ tratment}{OD\ control} \times 100$$

Study the toxicity of LPS-ZnO NPs in vitro

The 3-(4, 5-dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide (MTT) was used to determine the cytotoxicity of ZnO NPs, LPS, and ZnO NPs coated by LPS at concentration 25, 50, 100, 200, and 400 µg ml^{-1}. A normal cell line (WRL68) was used for this purpose following the method described by (Mossman, 1983) with some modifications according to (Ahamed, *et al.*, 2011). The absorbency is determined on a microplate reader at 492 nm, and the assay was performed in triplicate. The inhibition rate of cell growth (the percentage of cytotoxicity) is calculated as the following equation (Alsaedi *et al.*, 2019).

Cytotoxicity = A-B/A *100, where A and B are the optical density of control and the optical density of test respectively.

Statistical analysis

All statistical analyses were carried out using One-Way ANOVA and Duncan, and the statistical significance was found as $p \leq 0.05$. The data was determined using Graph Pad Prism version 6 (Graph Pad Software Inc., La Jolla, CA)

Results and discussion

Bacterial isolates

A total of 100 isolates of *K. pneumoniae* were isolated and identified up to species level by standard biochemical tests and the VITEK2 system. They were obtained from Blood (25.81%), Burn (23.66), urine (15.05%), wound (11.83%), sputum (10.75%), lung fluid (6.45%), and each ear, pus, and catheter (2.15%) as mentioned in Figure 1.

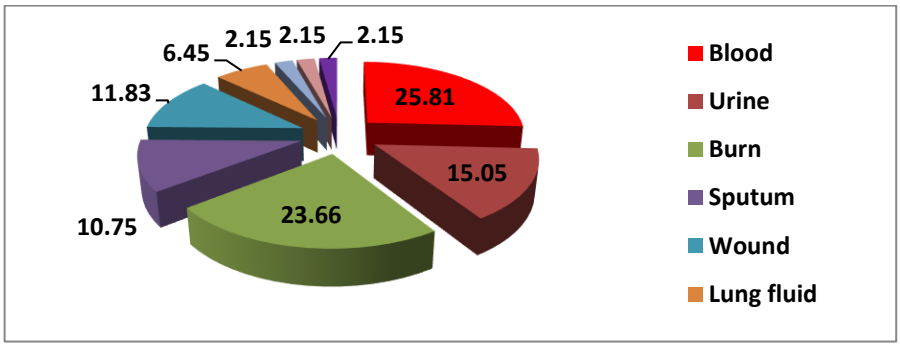


Figure 1: Percentage of *Klebsiella pneumoniae* isolates from different clinical samples

K.pneumoniae is the main cause of nosocomial pneumonia, urinary tract infections, and septicemia, especially in blood cancer patients, newborns and additional immunocompromised candidates despite the usage of suitable antibiotic treatment morbidity and mortality owing to *Klebsiella* bacteremia and pneumonia exceeded 50% (Ahmad, 2012) It causes lung infection especially infection of the upper lobe in which extra common, and symptoms consist of chills, fevers, and leukocytosis with red currant jelly–like sputum, rare problems exclude lung infection including necrosis and sloughing of the entire lobe (Janda and Abbott, 2006).

Antibiotic resistance test

Results showed the highest level of resistance 100.00 % to Ceftazidime followed by 72.73% to piperacillin and ceftriaxone in contrast the lowest resistance rate of *K. pneumoniae* isolates was to gentamicin which had 18.18% followed by Imipenem 0% as in Figure 2.

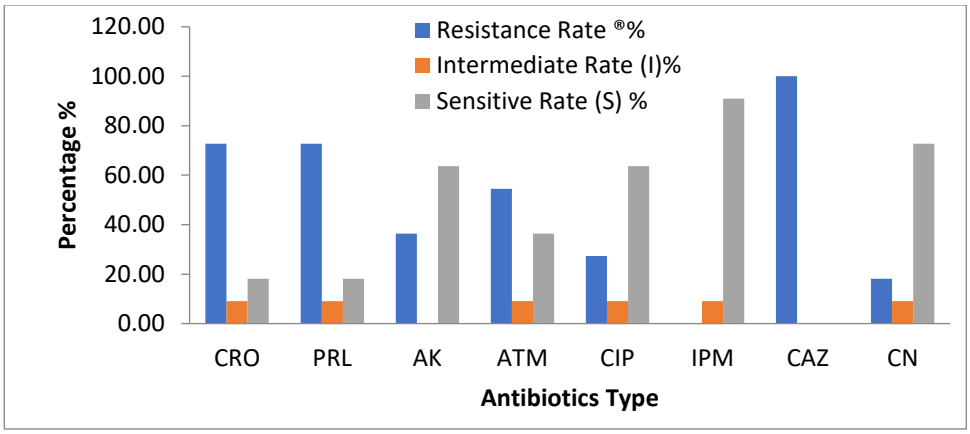


Figure 2: Pattern of antibiotic resistance of *K. pneumonia*e isolates.

Xiao *et al.*, (2020) showed different rates of antimicrobial susceptibility for *K. pneumonia*e against β-lactam antibiotics and non- β-lactam antibiotics.

Characterization of ZnO-Nps

Scanning Electron Microscope Analysis

Figure 3 represented the SEM image which exhibited the morphological properties of the ZnO NPs, while the dimensions of the particle range between 19.86 to 22.27 nm and appeared as a flower shape.

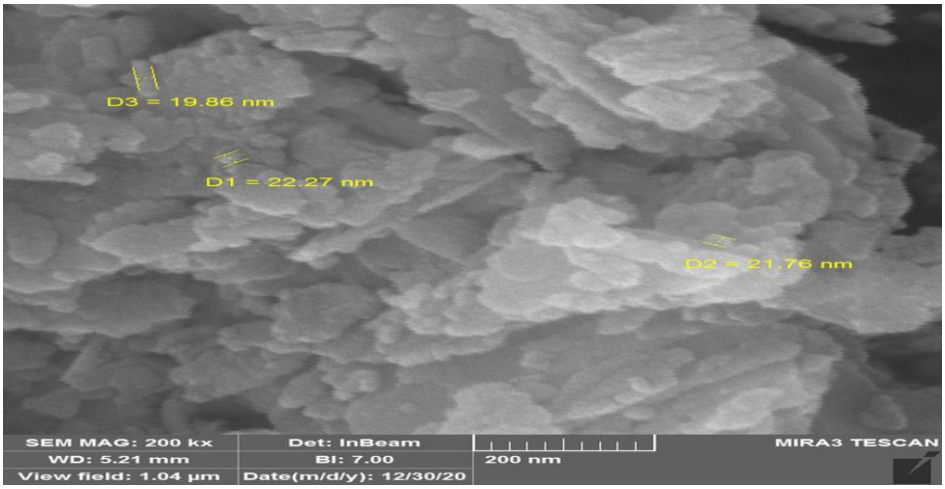


Figure 3: SEM analysis of ZnO nanoparticles

The morphology of NPs is an important side that participates in the physicochemical properties of the substances (Kuruppu *et el.*,2020). The researcher, Xiong, et *al.*, (2007) suggests that the ZnO nanocrystals are approximately spherical in shape with an average diameter of less than 80 nm.

X-ray diffraction analysis

The crystal phase and crystallinity of ZnO NPs were analyzed using XRD pattern, as shown in Figure 4, the observed lattice planes (100), (002), (101), (102), (110), (103), (200), (112) and (201) and corresponded to the 2θ values of 32.02°, 34.68°, 36.61°, 47.77°, 56.85°, 63.16° 68.16°, 69.32° and 72.91° respectively, and the diffraction peaks are well steady with the hexagonal phase of ZnO according to JCPDS card No 36-1451 (Alim *et al* 2005). The calculated average crystal diameter by Scherer's equation was found to be 17.39 nm.

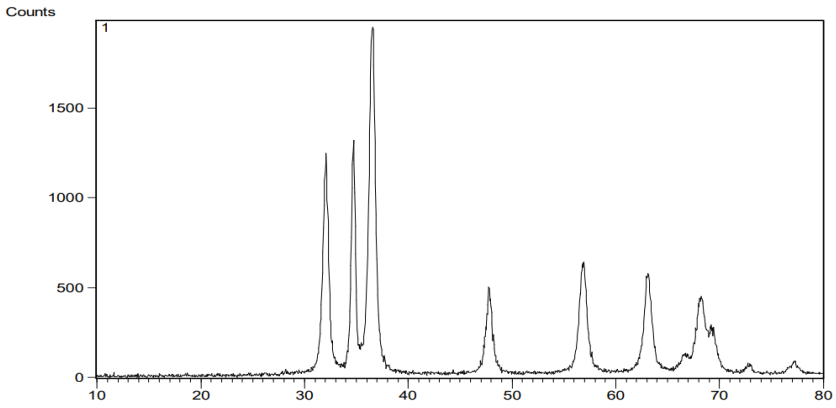
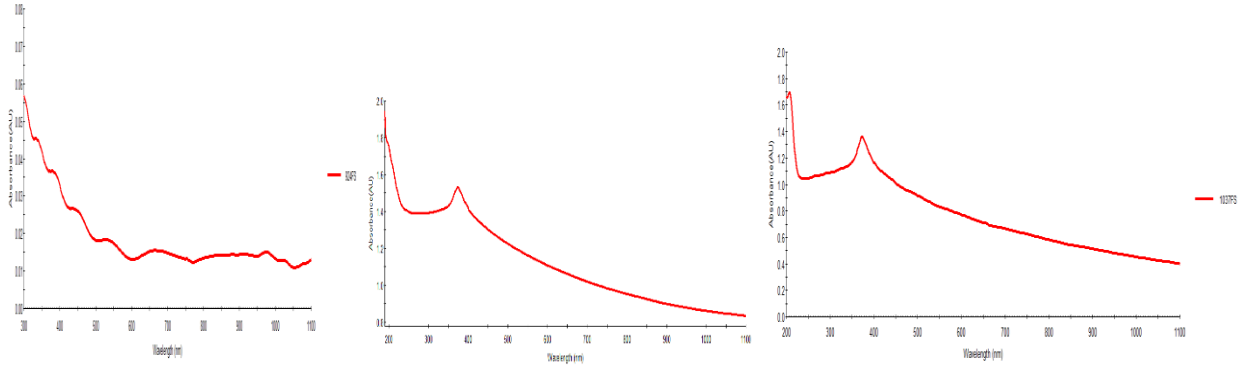


Figure 4: XRD pattern of ZnO NP

Line broadening of the diffraction peak is an indication that the synthesized material was in the nanometer range (Osuntokun *et al.*, 2019). This result is in agreement with the result reported by (Matinise *et al.*, 2017) showed that the average crystallite size as calculated by Scherer's equation was found to be 19.58 nm.

LPS–ZnO NPs binding

The UV –Visible spectroscopy is a highly used technique to distinguish the optical properties of the nanoparticles. Figure 3 showed an absorption peak at 370 nm which indicates the presence of ZnO NPs, while UV analysis to LPS– ZnO NPs were exhibited a discrete shift of UV–VIS spectrum with two peaks, first peak at 193.15 nm and a second peak at 374.91 nm. Also, there was a decrease in absorbance value 1.4 to ZnO– Nps peak compared with nanoparticles alone 1.55 which indicates the binding of LPS to the ZnO–NPs surface.



A B

C

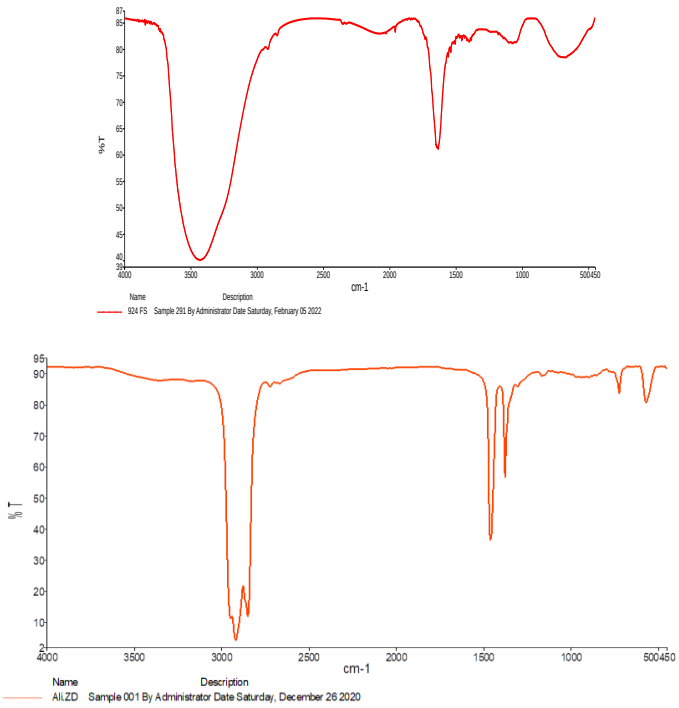
Figure 5: UV–visible spectroscopy analysis of: A– LPS extracted from *Klebsiella pneumoniae,*

B– ZnO NPs, C– LPS– ZnO NPs

The spectrum reveals a characteristic sharp absorption peak of ZnO nanoparticles at 308 nm, and the intensity and sharpness confirm that the particles are nano–sized and the distribution of particle size is narrow (Gholamrezaei *et al.*, 2014) and Jamshidi *et al.*, (2013)

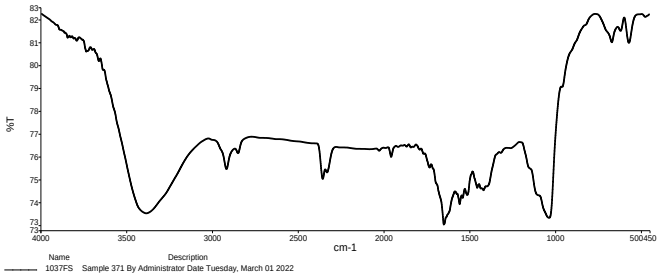
reported a corresponding absorption peak of ZnO NPs at 360 nm due to the transmission of electrons between the ranges from the deep level of the valance range.

To further confirm that LPS can attach to the surface of 17.39 nm ZnO- NPs, FTIR analysis was used to compare the materials before and after binding. The FTIR spectrum of LPS showed fatty acid region at ($3000–2800$ cm^{-1}), amide region at ($1800–$ 1500 cm^{-1}), polysaccharide region ($1200–900$ cm^{-1}). Also, the band at 533.71 cm^{-1} was confirmed the stretching vibration of hexagonal phase ZnO-NPs. While FTIR analysis for LPS- ZnO NPs showed that the peak at 2920.57 cm^{-1} corresponds to the C–H stretch, and the peak at 2853.03 stretchings showed O–H stretch. While the peak at 1539.70 cm^{-1} it is referring to the C–N stretch of amide in protein, and the peak at 1034.65 cm^{-1} is referred to as C–O stretching. Also, the band at 568.66 cm^{-1} showed the stretching belonging to ZnO NPs.



A

B



C

Figure 6: FTIR analysis of: A- LPS, B- ZnO NPS, C- LPS-ZnO NPs

These results were agreed with (Lukovic Golic *et al.*, 2012) who explained the band at 533.71 cm^{-1} is confirmed the stretching vibration of ZnO NPs is 546 cm^{-1}, the other peaks such as 1074 and 1028, 871 cm^{-1} correspond to the existence of ZnO and organic groups, which could be due to the presence of zinc-hydroxy-acetates. Similar results were also reported by (Shadpour and Maryam 2012) showed that the spectrum showed a broad peak around 457 cm^{-1} and shoulder around 545 cm^{-1} which corresponds to ZnO nanoparticles.

Antibacterial activity of LPS-ZnO NPs

The highest antibacterial activities of LPS- ZnO NPs compared with ZnO NPs and LPS separately were showed a high inhibition zone (31.8 mm) for *K. pneumoniae* followed by *S.epidermidis* (27 mm), *S. aureus* (22 mm), *Candida albicans* (21 mm), and *E. coli* (20 mm) as shown in Table 1.

Table 1: Antibacterial effect of ZnO NPs, LPS, LPS- ZnO NPs on pathogenic bacteria

Bacterial isolates	Inhibition zones (mm)		
	ZnO NPs	Lipopolysaccharide	ZnONPs + Lipopolysaccharide
S.epidermidis	16	15	27
S. aureus	13	20	22
Klebsiella pneumoniae	11	15	31.8
E. coli	14	12	20
Candida albicans	15	10	21

The antibacterial activity of ZnO nanoparticles against multidrug-resistant bacteria increases when the particle size decreases. ZnO NPs can generate reactive oxygen species damage caused to the bacterial cell membrane (Allaker and Memarzadeh 2014). Al-Ogaidi (2017) showed a similar effect of ZnO NPs (20 nm) against pathogenic bacteria. While the antibacterial activity assay of LPS extract of *Klebsiella pneumonia* was showed that all tested bacterial isolates were sensitive to LPS (100%) compared with amoxicillin that all bacteria resistant to it (CLSI, 2014).

Antibiofilm activity of LPS-ZnO NPs

LPS- ZnO NPs were able to decrease biofilm formation from pathogenic bacterial isolates. Results showed that inhibition percentage of biofilm found in Table 1 against *P. aeruginosa, S.aureus, A. baumannii, and E.coli*. The higher inhibition percentage of biofilm was found in

P. aeruginosa when treated with LPS-ZnO NPS 95%, ZnO NPs was 54.4% and LPS was 44.9%, while the lower inhibition percentage of biofilm 90% was found to *E.coli*.

Table 1: Antibiofilm of LPS, ZnO-NPs, and LPS-ZnO against pathogenic bacteria isolates

Bacterial isolates	Biofilm inhibition %		
	ZnO-NPs	LPS	ZnO-NPs + LPS
P. aeruginosa	54.4	44.9	95
S. aureus	52.1	44.2	92
A. baumannii	55.5	54.4	92
E. coli	53.7	54.3	90

Study the toxicity of LPS-ZnO NPs in vitro

Table 2 explained the effect of LPS- ZnO NPs at different concentrations (400, 200, 100, 50, 25) µg / mL on the WRL 68 cell line, and showed lower effects on the cell viability rate which was 68±6.0, 85±3.0, 95±1.0, 96± 1.1, and 95±1.0 respectively. Adding the same concentration of LPS to the WRL 68 cell line did not show a significant effect of viability rate 70±2.2, 83±2.0,93±2.1,95±1.1, and 98±1.5 respectively. While the effect of ZnO NPs in the same concentration on the WRL 68 cell line showed low effect and the viability rate was 62±3.9, 74±0.8, 90±3.3,94±, and 95±1.0 respectively. In comparing LPS- ZnO NPS results with the cytotoxicity of LPS and ZnO NPs, it did not show significant differences, and the inhibition rate of the normal cell line (WRL 68) was 70- 95%.

The local study by Abdu-lateef *et al*., (2021) concluded that LPS extracted from *Klebsiella pneumoniae* with good cytocompatibility when applied LPS against normal WRL68 cell line. While Jang *et al*. (2017) studied the lipopolysaccharide coated copper sulfide nanoparticles (LPS-CuS), they examined the cytotoxic effect of it in the L132 cell line and found that 100 and 200 µg/ml LPS-CuS did not induce cell death of these cell lines.

Table 2: Cytotoxicity test by WRL68 cell line after treated with LPS-ZnO NPs.

Concentration of ZnO NPs (µg/ml)	*Viability of WRL7 cells (%) ± SD		
	ZnO-NPs	LPS	ZnO NPs- LPS
400	62±3.9	70±2.2	68±6.0
200	74±0.8	83±2.0	85±3.0
100	90±3.3	93±2.1	95±1.0
50	94±1.5	95±1.1	96±1.1
25	95±1.0	95±0.82	98±1.5
*Values are expressed as mean ±SD of three experiments.			

Conclusion

Due to the importance of adopting different compounds as alternative medicines for treating many diseases, the antibacterial and antibiofilm activities of LPS- ZnO NPs were estimated against pathogenic bacterial isolates, and the cytotoxicity of the mixture was tested and exhibited good results as a safe combination when used for different applications.

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"Does Brain or Renal Expression of KRAS be influenced by Silver-Nanoparticles?"

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Abstract:

There have been several reports claiming that silver nanoparticles (AgNPs) are not absolutely safe. The purpose of this study is to look into the potential of CNS and renal molecular toxicities (expressed by changes in KRAS expression) that might occur when mice are injected with various AgNP doses. The results showed that as the AgNPs dosage was raised, KRAS expression rose significantly.

Introduction:

Nanoparticle production is increasing these days for different and important purposes. (1-3). For a variety of reasons, AgNPs are widely employed nanoparticles, including antibacterial action against numerous species (4, 5, 6, 7), cheap cost of synthesis (8), and other unique features (9) make them used in a variety of everyday items (10-12), but the likelihood of Ag+ ions leakage might compromise their safety (13-17). According to several studies, the AgNPs hazardous and the Ag+ emission have no correlation (18, 19), moreover, some investigations have indicated that metallic Ag nanoparticles toxicity may be stronger than the cytotoxicity of silver ions alone. (20, 21). N-, K-, and H-RAS are three often mutated human oncogenes that are important therapeutic targets (22). KRAS is the most often altered of the three RAS genes in various malignancies (23). The study here attempted to find the effects of employing AgNPs on KRAS genetic expression in CNS and kidneys.

Material & Methods

Nasir et al., (2020) accomplished the AgNPs formulation, mice grouping, the

Table (1): The primers used in this study for K-RAS & control genes.

Primers			Sequence (5 →3)	MT (°C)
Target gene	K-RAS	Forward	AGGCCTGCTGAAAATGACTG	63.9 °C
	K-RAS	Reverse	TCTGAATTAGCTGTATCGTCAAGG	65.9 °C
Control gene	β-ACTIN	Forward	CCTGAACCCTAAGGCCAAC	60 °C
	β-ACTIN	Reverse	ACGTACATGGCTGGGGTGT	62 °C

extraction of RNA, and the production of cDNA in a prior works (24, 25).

Results

Table 2 below shows the varying expression concentrations of KRAS in the

Table-2:

Duration	AgNPs/Kg	Mean ± SE	
		Brain	Kidney
7 days	0.025 mg	0.1096 ± 0.0328 a	0.0779 ± 0.0314 a
	0.5 mg	0.0223 ± 0.0038 c	0.0797 ± 0.0234 a
	1 mg	0.0480 ± 0.0042 bc	0.0183 ± 0.0057 b
14 days	0.025 mg	0.1005 ± 0.0367 ab	0.0585 ± 0.0237 ab
	0.5 mg	0.0609 ± 0.0147 abc	0.0107 ± 0.0045 b
	1 mg	0.0708 ± 0.0047 abc	0.0215 ± 0.0111 b
	Control	0.0259 ± 0.0059 c	0.0151 ± 0.0017 b
	LSD value	0.0543 *	0.0497 *
* (P<0.05).			

various organs investigated.

Discussion

There are a lot of evidences demonstrated that utilizing silver-containing items, even if they only contain a little quantity of silver, can cause molecular toxicity to the body's immune system and overall wellness. (26, 27).

The present study explained the positive connection of brain KRAS expression with the AgNPs concentration. Anyhow, the mice who received 0.5 mg of AgNPs for 7 days showed brain KRAS expression level less than that of control group. It has been conducted that human glioblastoma development is associated with activating RAS by specific pathway (28, 29). The activation of this pathway can generate mice glioma as a result of increased expression of oncogenic KRAS (30-33). Furthermore, Ju *et al.* found related results in zebrafish brain (34).

The current data announced the significant linkage of renal KRAS levels and the silver-nanoparticles dose. Nevertheless, the mice who spent 14 days on 0.5 mg of AgNPs gave renal KRAS concentration lower than that of the control group. KRAS overexpression or mutations stimulate abnormal cell proliferation (24, 35, 36). It has been found that the KRAS expression is increased significantly in 13.7% of renal cell carcinoma patients (37, 38). Furthermore, Kozma *et al.* (39) conducted that 16.6% of renal cell carcinoma samples showed KRAS amplifications and they found that these amplifications were correlated with the grade and size of tumor.

Conclusion

The findings of this investigation exhibited a strong link between KRAS levels and AgNPs dosage, indicating a possible hazardous connected with using AgNPs products.

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"A comparative study the effects of Ganoderma lucidum and Metformin on histological and biochemical characteristics in diabetic rats"

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Abstract:

Type 2 diabetes (DM) is a metabolic condition that occurs when insulin production is insufficient or insulin can no longer perform its intended purpose. Modern medications and insulin injections can be used to treat diabetes mellitus, but medical treatment is difficult to provide because of its high cost and potential adverse effects. Comparative effects of Ganoderma lucidum extract and metformin on diabetic rats will be examined in this review. To test the effectiveness of natural supplement metabolites for human therapy, we used natural medicines like the macroscopic mushroom. In terms of health benefits, mushrooms are among the most promising and potent foods on the world. For example, Ganoderma lucidum possesses a bioactive component that is extremely potent and efficient. G. lucidum's hypoglycemic activity as an antioxidant is connected to an increase in insulin hormone. This mushroom, unlike oral anti-diabetic medicine, is thought to increase insulin release, decrease blood glucose concentration, and successfully lower blood glucose levels.

Keywords: Metformin, Ganoderma lucidum, Mushrooms, and Ganoderma lucidum for Diabetes mellitus.

1.Introduction

Glycosylated hemoglobin and insulin levels decline when blood glucose levels rise in people with diabetes. (Ratnaningtyas *et al.,* 2018). A deficiency in insulin production or its inability to perform its intended role can lead to this disease. Microvascular and macrovascular problems can result from hyperglycemia in patients with diabetes mellitus (DM). (Brahmachari, 2011).

There are two types of diabetes mellitus: type 1 DM (insulin dependent DM), which arises when pancreatic cells are damaged, and type 2 DM (non-insulin dependent DM), which happens when the pancreas is unable to produce insulin or insulin resistance is present. (DiPiro *et al.,* 2014). Pharmacologic and non-pharmacologic treatments for diabetes mellitus (DM) both attempt to manage blood glucose levels and prevent complications. Diet and exercise are two examples of non-pharmacologic treatment. An insulin injection or an anti-diabetic pill is a form of pharmacologic treatment (DiPiro *et al.,* 2014). It is possible to treat diabetes mellitus with contemporary drugs and insulin injections; nevertheless, medical therapy is challenging due of its prohibitive cost. Using natural medicine, such as a microscopic fungus with therapeutic characteristics, is another option for treating diabetes mellitus. Potential, advantage,

and efficacy are all key aspects of mushrooms. Ganoderma, for example, has an extremely potent bioactive molecule. (Khastini *et al.,* 2018). Ganoderma lucidum's body contains a terpenoid, steroid, polysaccharide, ergothioneine, saponin, a flavonoid alkaloid, an amino acid, a mineral, and a vitamin (J W M Yuen & Gohel, 2008). G. lucidum possesses hypoglycemic characteristics as a result of the antioxidant terpenoid found in the plant. Due to the insulin-inducing qualities of this mushroom and its ability to reduce blood glucose levels, it is believed to be as effective as oral anti-diabetic medication. (2012) (Styskal et al.). Mao et al. (2009) found that rats treated with G. lucidum extract were protected from developing major kidney impairment as a result of diabetes. Triterpenoid also acts as an aldose reductase inhibitor, and -glucosidase is effective in inhibiting the production of reactive oxygen species (ROS) (Pietta, 2000).

Review of the literature

2.1. Diabetes:

Metabolic disease's most prevalent symptom is chronic hyperglycemia. According to (Kerner & Brückel, 2014): Blood glucose and triglyceride levels are rising, while HDL cholesterol levels are falling, demonstrating the severity of this disease's complications. (Kawanami and colleagues, 2016). Diabetes is a long-term condition that is getting more and more common each year. (Pei and colleagues, 2019) People with a family history of diabetes, as well as those who lead unhealthy lifestyles, are at greater risk of developing diabetes and gestational diabetes. (Yanling Wu and colleagues, 2014). Diabetic complications, such as the development of extracellular matrix protein and alterations in microvasculature as well as the thickening of the capillary basement membrane, may be increased by prolonged exposure to free radicals." (Chawla and colleagues, 2016)

2.1.1. History of Diabetes Mellitus

A compass, siphon, or "one that straddles" is the medical name for diabetes. The word "diabts" is used to describe a situation in which excessive volumes of urine are secreted as a result of the concept of "siphon" (Association, 2013). Type I and Type II diabetes were initially identified around 400 to 500 by Indian physicians Sushruta and Charaka, with the type I associated to younger individuals and the type II linked to obesity. Leutholtz and Ripoll (2011). Avicenna distinguished between primary and secondary diabetes, described diabetic gangrene, and prescribed lupine, zedoary seed, and trigonella to cure the disease, all of which resulted in a significant decrease in the body's sugar output. According to Jansson et al. Research in the 1980s found that immunosuppressive medications .

2.1.2. Diabetes Epidemiology

In every country in the world, diabetes is a serious public health problem, and it is regarded one of the most challenging issues of our time (Jia, 2014). When the likelihood of death is taken into account, diabetes is the seventh leading cause of mortality overall and the third most deadly (Shaw et al., 2010), Urbanization and a change to a more "Western-style" diet are to blame for the rise in diabetes complications in emerging countries (Deguchi & Miyazaki, 2010). Diabetes was found in 415 million persons aged 20 to 79 in 2015; five million people died from it; and $673 billion was spent on worldwide healthcare because of it. Diabetes affects 75 percent of people in low- and medium-income nations. According to current projections, 642 million individuals between the ages of 20 and 79 would be diagnosed with diabetes by the year 2040. (Ogurtsova et al., 2017). Diabetic animals have been seen in a wide range of species, including cats, dogs, mice, and rats .

2.1.3. Diabetes Mellitus Comes in a Variety of Forms

Various types of diabetes are classified by the American Diabetes Association (Association, 2019) as follows:

2.1.3.1. Insulin-dependent diabetes mellitus, often known as juvenile-onset diabetes, is a kind of type I diabetes.

Insulin insufficiency can result from an autoimmune attack on the beta cells of the pancreas. The autoimmune death of pancreatic cells is the cause of this kind of diabetes, which was formerly referred to as IDDM (Care, 2010). About ten percent of people with diabetes have type I diabetes (Paschou et al., 2018). The incidence of Type I diabetes is growing by 3% every year over the world, according to current data (Borchers et al., 2010) There was a steady loss of beta cells that produced insulin as a result of an invasion of lymphocytes and monocytic cells into the pancreatic islets, a sign of Type I diabetes (Burrack et al., 2017). There are several genes that have a role in the expression of Type I Diabetes. When 50 to 90 percent of the -cells were killed, the illness became clinically evident (Steele et al., 2004) Type I diabetics cannot maintain blood glucose hemostasis because of the requirement for insulin in glucose consumption. Numerous studies have attempted to discover the causes of diabetes type I, but the disease's etiology remains a mystery. Patients with Type I diabetes are at risk for complications such as cardiovascular disease, kidney disease, and strokes, all of which can lead to early death (S. I. Lee et al., 2015). Genetic predisposition is essential to allowing the autoimmune process to progress. A model proposed by Rewers & Ludvigsson (2016), however, suggests that multiple environmental exposures to neo-auto-antigens might disrupt the immunological tolerance of cells, leading to the creation of new hybrid peptides that behave

as neo-antigens. Environmental variables, viral pathogen infections, and dietary components are only a few of the potential triggers for type 2 diabetes (Christen & Von Herrath, 2011) It is possible to distinguish between NIDDM and diabetes type I by analyzing for pancreatic autoantibodies, which are common in diabetes type 1.

2.1.3.2. Diabetic type II (adult-onset diabetes or non-insulin dependent diabetes mellitus, (NIDDM)).

The prevalence of long-term, insulin-dependent diabetic mellitus (NIDDM) has been steadily increasing over the world (Olokoba et al., 2012). The deterioration of insulin production by the -cell and the emergence of insulin resistance are the main pathophysiological characteristics of this kind, which jointly contributed to the disease's progression (Kohei, 2010). Diabetes self-management is often considered as the foundation for successful treatment of this condition (Ausili et al., 2017). Insulin's capacity to reach the target tissues, notably the muscles and the liver, is impaired in NIDDM diabetes. Hyperinsulinemia as a result of the insulin resistance is known as compensatory hyperinsulinemia. Hyperglycemia may develop from the subsequent resistance to insulin action, which may limit glucose consumption by insulin-sensitive tissues, leading to an increase in glucose synthesis by liver tissues. Several decades have passed since the hypoglycemia and hyperinsulinemia were first linked to the decline in insulin secretion capability and worsening of hyperglycemia in the islets of Langerhans (DeFronzo et al., 1992)Additionally, diabetes type 2 may lead to blindness, gangrene of the lower limbs, with NIDDM, anxiety, depression, and other psychological problems were shown to be prevalent (Tang et al., 2016) Definitely, a successful identification of an individual with an early diabetes might not only reduce the chance of the patient progressing to a complete diabetes with substantial consequences, but also greatly reduce the expenditures. As a result of the diagram structures' major qualities, those who are at a high risk of developing diabetes might be quickly and easily identified and guided to a variety of education specifically tailored for diabetes prevention, hence enhancing public health interventions. Without a doubt, great efforts have been made to prove the benefits of diabetes prevention by minor alterations in lifestyle .

2.1.3.3. Diabetes during pregnancy is known as gestational diabetes mellitus (GDM)

An essential problem in pregnancy occurs when women who have not previously been diagnosed with diabetes acquire a long-lasting hyperglycemia during pregnancy. Pregnancy-related gestational diabetes affects 2-5 percent of all pregnancies due to reduced glucose tolerance caused by -cell dysfunctions, the most common cause of hyperglycemia in these cases (Plows et al., 2018). Researchers (Plows et al., 2018). Women with GDM are more likely to develop type II diabetes after giving birth, and their children are more likely to grow up

obese as a result of this increased risk (Wysham & Kirkman, 2011). The authors (Wysham and Kirkman, 2011). The prevalence of GDM has been shown to range from 1% to 28% (Hod et al., 2015) and is on the rise, particularly in developed countries (Burlina et al., 2019). (Burlina and colleagues, 2019)

2.1.4. The following are the signs and symptoms that you should be aware of:

The traditional symptoms of diabetes, polyuria, polydypsia, and polyphagia, occur often in people with type 1 diabetes and are exacerbated in those with type 2 diabetes who have extremely high blood glucose levels. Only in cases of type 1 diabetes or if type 2 diabetes goes undiscovered for a lengthy period of time is extreme weight loss usual. Also notable are the usual symptoms of invisible diabetes, such as weight loss, exhaustion and restlessness, and discomfort in the joints and muscles. If the symptoms are minor or progress at a gradual rate, they may go unnoticed (Ramachandran, 2014).

2.1.5. Diagnosis test of diabetes:

The oral glucose tolerance test is a widely used procedure (OGTT). A fasting and two-hour post-glucose test may be used to diagnose impaired fasting glucose (IFG), impaired glucose tolerance (IGT), and diabetes (fasting glucose > 126 and two-hour post-glucose glucose > 200 mg/dl). When a random blood glucose reading is greater than 150 mg / dl, an OGTT is required. HbA1c (glycosylated haemoglobin) has been recommended recently as a test for diabetes (> 6.5 percent). HbA1c levels between 5.7 and 6.4 percent indicate the presence of pre-diabetes (Organization, 1999). Due to the fact that gestational diabetes is asymptomatic until 24-28 weeks of pregnancy, pregnant women without a family history of the condition should be examined. Diabetes is far more likely to develop if you have preexisting GDM (Wysham & Kirkman, 2011).

2.1.6. Estimated biochemical markers in diabetes

In the diagnosis of diabetes mellitus, glucose, cholesterol, triglycerides, high-density lipoprotein cholesterol (HDL), and low-density lipoprotein cholesterol (LDL) levels are determined (von Eckardstein et al., 2000). Increased glucose, total and low density lipoprotein (LDL) cholesterol, triglycerides, blood pressure, and glycohemoglobin levels in the serum are all connected with diabetic illnesses (Sollu et al., 2010). In female patients, glucose levels were shown to be positively linked with creatinine, alkaline phosphatase, ALT, and AST levels, however there was a significant difference between the control and patient groups (Salih, 2013). Another recently found diabetes indicator is oxidative stress (Plows et al., 2018). This biomarker is capable of indicating the severity of a problem, identifying patients at increased risk of complications, and monitoring the patient's response to therapy. In diabetics, hydrogen

peroxide, malonyldialdehyde, and glutathione peroxidase may all be indications of oxidative stress (Hartnett et al., 2000).

2.1.7. Diabetes-related histological changes:

Even in a short period of time, DM mellitus produced harm to the liver and kidney, with early inflammatory alterations in the architecture and congestion/infiltration modifications in the interstitium, according to a research by Sangi and colleagues (2020). Many studies have found that STZ-induced diabetes alters blood biochemistry and produces pathophysiological changes in rats' livers. The degree of steatosis, steatohepatitis, and liver fibrosis that results from an experiment can be affected by the duration of the study as well as the dose used to induce the condition. The diabetic group's livers were found to have pathological alterations indicative of progressive transformation, for example, the appearance of many dark-stained shrunken hepatocytes and little dark nuclei (apoptosis) (Balamash et al., 2018). Diabetic kidney tissue included renal corpuscles with glomerular capillary atrophy. Additionally, the renal tubule lining epithelium exhibited unstained degeneration, but the arterioles exhibited extensive muscular media thickening associated with perivascular edema, fibrosis, and moderate interstitium lymphocytic infiltrates (Fig. 4). (2013) (Velmurugan et al.).

2.1.8. Diabetes is treated in the following ways:

NIDDM can be treated with a combination of diet and physical activity changes, as well as the use of hypoglycemic medicines that lower blood glucose (Petersen & Shulman, 2006). Obesity management and patient education are two key components of the lifestyle changes that should be implemented for all diabetics (Chaudhury et al., 2017). Acarbose and miglitol are two examples of antidiabetic drugs that are extensively used in Asia (Khan et al., 2019) As part of their anti-diabetic arsenal, researchers have discovered inhibitors for the digestive hormone breakdown enzyme, DPP-4 (CD26, 3.4.14.4, DPP-4,EC). Vildagliptin, saxagliptin, alogliptin, and sitagliptin are examples of FDA and EMA-approved medications in this category. In addition to increasing insulin release, they also interfere with glucagon secretion (Egan et al., 2014). In the treatment of Type II diabetes, Metformin is the medicine of choice (Viollet et al., 2012). Because it's low-cost, it's safe, and it's incredibly efficient. Delaying or inhibiting carbohydrate digestion is an important part of non-insulin-dependent diabetic mellitus (NIDDM) therapy. Reduced hunger and intestinal carbohydrate absorption are the primary mechanisms of action, together with suppression of hepatic gluconeogenesis and an increase in peripheral glucose uptake (Papanas & Maltezos, 2009). Metformin also enhances the metabolism of glucose in muscle and liver by increasing insulin sensitivity (Emslie-Smith et al., 2001). When metformin stimulates intestinal glucose consumption, it also produces lactate that is used as

an energy source for glycogenogenesis in the liver (McCulloch, 2008). As a result of increased lactate generation and impaired hepatic metabolism, lactic acid buildup may occur with Metformin usage (Gan et al., 1992). The liver, kidneys, and skeletal muscles are all involved in the removal of lactate from the bloodstream.

2.1.9. Changes in Metformin-induced Biochemistry and Histology

All biochemical indicators in diabetic patients were elevated, as previously noted, as a result of the disease's effects on the liver, kidneys, and other organs. AST, ALT, and creatinine levels in the metformin group were significantly lower than in the diabetic control group (Khadre et al., 2011). As Nathan and colleagues (2008) found, having an elevated level of alpha-tocopheryl tyrosine (ALT) is associated with a greater risk of developing type 2 diabetes. Harris' (2005) Alloxan's hepatotoxic impact is suggested by the rise in AST and ALT serum levels, which may be the result of enzyme leakage from the liver cytosol (Navarro et al., 1993). AST and ALT enzyme activity in the serum of diabetic rats treated with the combination medicine was much lower than that of diabetic rats, but the measurements did not approach the normal value. Attributable to the fact that metformin has been shown to be successful in both monotherapy and in combination with sulfonylureas, this outcome may be due to this (Davidson & Peters, 1997). In addition, metformin therapy improved liver and renal function tests, as reported by Balamash et al. (2018According to the findings of Khadre et al. (2011), metformin's anti-diabetic effects may be responsible for the improvement in liver histology seen in this study. In STZ-diabetic rats, metformin (25mg/kg) for 28 days resulted in a significant improvement in liver histological abnormalities (Yanardag et al., 2005). Diabetic nephropathy's glomerular and tubular lesions were not improved by studying normoglycaemia with glimepiride, metformin, or the combination of the two. Furthermore, glimepiride and metformin-treated groups show atrophy of the glomerular capillaries and a widening of the Bowman's gap, as well as an increase in serum albumin, compared to the control group. As a result, the kidneys are unable to reabsorb the protein they make through renal tubules as they typically would. Proteins of intermediate molecular weights cannot enter the Bowman space, as demonstrated by this study (Khadre et al., 2011). Treatment with metformin (DM) improved the islets of Langerhans and normal -cell population, and there was no evidence of degenerative changes in the DC group, according to a study by Balamash et al. (2018). The liver tissue of STZ diabetic rats had its normal structural organization restored following therapy with metformin, showing the drug to be protective against hepatic harm.

2.2. *Ganoderma lucidum*

A fungus native to China and other Asian nations, Ganoderma lucidum, has been used for centuries to improve health and longevity. Large and glossy, it has a woody feel and a black mushroom appearance. The Latin term "Lucidus" means "shiny" or "bright," and it refers to the mushroom's glossy look (Wachtel-Galor et al., 2011). The Lucidum Group, Inc. Chinese lingzhi (Ganodermataceae family) is known as reishi or mannentake in Japan, whereas in China it is known as lingzhi. Commercial G. lucidum products come in a variety of forms, including powders, nutritional supplements, and tea. Mushroom spores, mycelia, and fruit bodies all contribute to the creation of these structures. Lingzhi's specialized uses and qualifying health advantages include the management of blood glucose, modulation of the immune system, hepatoprotection, .

The s 011).

DXN Farm is Southeast Asia's largest Lingzhi farm. DXN is the first lingzhi farm in Malaysia to receive ISO 14001 accreditation and an Organic Farming Certificate thanks to its organic farming practices. Ganoderma high quality agriculture in DXN is widely renowned for its unique qualities.

The following are the distinctions:

Temperatures range from 26oC to 27oC in a humid and warm atmosphere.

Water that is free of contaminants and has a pH between 7.0 and 7.9.

To guarantee that our products are devoid of toxins, our farms are positioned outside of colonized and polluted regions.

Instead of synthetic fertilizers, pesticides, and steroids, natural resources such as rice chaff and sawdust are utilized in organic farming. Methods like this one create more than 200 kinds of components such as enzymes and coenzymes; amino acids; vitamins; glucose; and other trace elements that help to improve the quality, quantity, growth, and resilience of crops to pests.

There are one million pieces of Ganoderma generated from a single mother plant using the Tissue Culture Method.

In order to protect Ganoderma's development and quality from unwanted substances, the suspension arrangement technique is employed.

Figure 2: The DXN pharmaceutical manufacturing facility

2.2.1. Major bioactive components

Protein makes up 10% to 40%, fat 2%, starch and sugar 3% to 28%, ash 3% to 8%, and vitamins and minerals including potassium, calcium, phosphorus, and magnesium 8% to 10% of the overall composition (Borchers et al., 1999). It's a given that there will be non-volatile G. " lucidum has been found to contain 1.8% ash, 26-28 percent starch, 3-5 percent crude fat, 59 percent crude fiber and 7-8 percent crude protein, according to the results of this study (Mau et al., 2002). As well as the numerous bioactive chemicals found in mushrooms, terpenoids, phenols, nucleotides (and their derived products), glycoproteins, and polysaccharides are also found in mushrooms. Mushrooms are particularly rich in the amino acids lysine and leucine, in addition to the essentials. It has a low amount of polyunsaturated fatty acids in its total fatty acid makeup, which is higher than most other foods (Borchers et al., 1999; Sanodiya et al., 2009). Peptidoglycans, polysaccharides and triterpenes are the key components of G that have a direct impact on human well-being and wellbeing. The key to this game is lucide (Boh et al., 2007; Zhou et al., 2007). Inflammatory, hypoglycemic, anti-ulcerative, and immunostimulant activities may be found in G. Lucidum polysaccharides (GL-PSs) (Tomoda et al., 1986; Bao et al., 2001; Wachtel-Galor et al., 2004).

2.2.2. Applications in the field of medicine

For hundreds of years, G. Lucidum has been utilized as a health-enhancing and recuperation therapy. The effects of G on human health are now being studied using various animal and

cell culture models and in-vitro methods. In the field, you'll find Lucidum and tales of human experiments as well.

2.2.2.1. Anti-tumor activity

Cancer continues to be the leading cause of death in the world, despite substantial advances in early identification of the condition and chemotherapy treatments (Organization & Control, 2008). Taking G. lucidum as a supplement in conjunction with normal cancer therapy is a common practice among otherwise healthy people. This is the name of the game: lucidity (Wasser & Weis, 1999;Borchers et al., 2008). It is possible to separate chemical compounds from the fruit, mycelia, or spores of G. Lucidum, which contain a considerable quantity of a compound's active ingredient. In multiple in vitro and in vivo studies, polysaccharides and triterpenes, two of the mushroom's key component groups, have been shown to exhibit anti-angiogenic and anti-metastasis characteristics (John W M Yuen & Gohel, 2005; Zaidman et al., 2005).

2.2.2.2. Antioxidant activity

Antioxidants protect biological components from oxidative damage, which is likely to limit the danger of mutations and carcinogenesis and sustain immune cells as well. (Benzie & Wachtel-Galor, 2009). G. lucidum Specific in vitro components. Lucidum displays antioxidants, notably polysaccharides and triterpenoids (J W M Yuen & Gohel, 2008; Saltarelli et al., 2009; Yalin Wu & Wang, 2009). (J W M Yuen & Gohel, 2008; Saltarelli et al., 2009; Yalin Wu & Wang, 2009).

2.2.2.3. Anti-diabetic effects

From Polysaccharides, proteoglycans and Triterpenoids in Ganoderma lucidum, the hypoglycemic effects may be shown (H.-T. Ma et al., 2015). G. lucidum polysaccharides showed hypoglycemic effects in mice by boosting insulin levels and reducing sugar levels in the blood stream (Hikino & Mizuno, 1989). Glycogen synthetase activity was reduced by these polysaccharides, which increased the activities of hepatic glucokinase, phosphofructokinase, and glucose-6-phosphate dehydrogenase. The generation of hepatic glucose was also inhibited, ensuring that no hyperglycemia was generated (Agius, 2007). Alloxan-induced damage to pancreatic cells was prevented by G. lucidum polysaccharides, which inhibited the activity of NF- B. Endothelial cell apoptosis, which is linked to cardiovascular issues, was the leading cause of death and morbidity in diabetic patients (He et al 2005).

2.2.3.. Treatment Mechanism by *Ganoderma* lucidum

-cells are repeatedly destroyed by the extremely reactive oxygen and reactive nitrogen species produced by hyperglycemia in diabetes. The body's antioxidant defense mechanism, as a result, is glucotoxic (Ganesan & Xu, 2019). A class of G-linked polysaccharides. A number of enzymes have been found to be significantly down-regulated in lucid, including iNOS, p66Shc, manganese superoxide dismutase, nitric oxide synthase, and glutathione. Preventing cell apoptosis and its associated aspects are an essential strategy to T2DM care after the discovery of the next harmful mechanism during diabetes mellitus. A study published in 2015 by Franz et al. Also G-polysaccharides. Lucidum significantly increased the expression of Bcl-2 and decreased the expression of Bax and caspase 3 in pancreatic cells compared to diabetic STZ rats. It was shown that polysaccharide from G was highly effective in diabetic rats. The hypoglycemic effect of Lucidum was achieved via preventing cell death. Zheng and colleagues (2019). Hypoglycemic G-Selectivity. Glucokinase, glucose-6-phosphatase, glucose-6-phosphate dehydrogenase, phosphoenolpyruvate carboxykinase, fructose-1,6-bisphosphatase, phosphofructokinase, and glycogen synthase are all key enzymes in the hepatic glucose metabolism pathway, and lucidum polysaccharides are associated with their expression. For example, in a study by Ma et al. When it comes to small-intestine absorption of carbohydrates, glucosidase activity plays a role (Ganesan & Xu, 2019). Genoderma triterpenoids and diabetes have been shown to inhibit this enzyme in clinical studies for a variety of causes. Because Ganoderma has the right impact and medicinal potential, we were hired (Klupp et al., 2016).

2.2.4. Biochemical and Histological Changes after treatment by *Ganoderma lucidum*:

Genoderma triterpenoids and diabetes have been shown to inhibit this enzyme in clinical studies for a variety of causes. Because Ganoderma has the right impact and medicinal potential, we were hired (Paterson, 2006). Since the rats in G. lucidum group had lower blood glucose levels than those in the control group (P 0.05), the pancreatic beta-cells' stimulation of insulin secretion was also maintained. Glucophage polysaccharides limit the absorption of glucose from the small intestines, maintain a set blood glucose level, and indirectly control insulin release through the regulation of insulin production (Lee et al., 2001). When compared to a diabetic control group, therapy resulted in a substantial drop in creatinine levels. Slows down the negative effects of diabetes and STZ on the neck, and reduces renal tissue toxicity, with G. Lucidum (Shao et al., 2013). Ganoderma and Streptozotocin treatment reduced total cholesterol, triglycerides (tendency), creatinine, and urea in rats, according to biochemical studies (2018). The beta-glucans in G. Lucidum, which have the ability to produce an aqueous layer in the colon and reduce sugar and fat absorption, may be linked to this treatment reaction. Streptozotocin-induced diabetes in mice was alleviated significantly by Ganoderma lucidum,

which lowered LDL, total cholesterol, and triglyceride levels by 50 and 150 mg/kg, respectively, in mice (Li et al 2011). Pretreatment with G. lucidum preserved normal ALT, AST, SOD, and GSH levels (Shi et al., 2002). Methanol extracts of G. Lucidum, on the other hand, have been found to be harmless for the liver. Lower serum AST and ALT activity at 96 hours after injury were evidence of the positive effects of G. lucidum oral treatment (Song et al., 1998). AST, ALT, ALP, and total bilirubin serum biochemical indicators of liver injury (Yueh-Wern Wu et al., 2010) were dramatically reduced by the therapy. Diabetes patients who received 60 mg of Ganoderma lucidum showed no difference in the frequency of degenerative and necrotic changes compared to diabetics in the control group after receiving the supplement. When administered Ganoderma lucidum at 120 and 180 mg, acute cell swelling, hydropic degeneration and necrotic alterations in the liver cells were seen, but their extent compared to diabetes c (Erolu & Beytut, 2018). The liver's fat accumulation was partially halted by GDLP at low and high dosages (H. N. Li et al., 2020). A 5-day G-treatment was also required by Raeta and colleagues (2020). In the case of alloxane, Pfeifferi and G. Resinaceum extracts have been shown to exhibit hepatoprotective properties. These samples have hypoglycaemic and hepatoprotective properties, which may be due to the presence of antioxidants such as gallic acid (Zanoello et al., 2002). Polysaccharides in G. lucidum also induced lymphocyte proliferation, according to the researchers (Liu et al.2002). Polysaccharides found in G. pfeifferi EtOH extract may also affect the regeneration action on pancreatic cells, although this effect has to be further investigated. It has also been shown in high-dosage GL treated groups by Pan et al. (2013) that the number of cells has grown, which suggests that the GL may have the capacity to remedy pancreatic islets. In STZ-induced diabetic rats, G. lucidum showed a hypoglycemic impact by reducing pancreatic -cell death and promoting -cell regeneration (J. Zheng et al., 2012).

3. Conclusions:

Diabetes is a major public health issue that affects people across the world. The high expense and potential adverse effects of medical therapy make it difficult to provide. Natural supplements like Ganoderma lucidum, the subject of current investigations, are being considered as potential treatments for these issues. Unlike oral anti-diabetic medication, this mushroom is believed to stimulate insulin release, reduce blood glucose concentration, and successfully lower blood glucose levels.

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"استخدام التحليل العاملي الاستكشافي والتوكيدي لتحديد أهم العوامل المؤثرة في فاقد ما بعد الحصاد للمحاصيل البستانية في العراق (اشجار اللالنكي والنارنج انموذج تطبيقي للبحث)"

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المستخلص

يعاني القطاع الزراعي في العراق من ظاهرة تزايد نسب الفواقد في اغلب الحاصلات البستانية الشتوية والصيفية ومنها محصولي النارنج واللالنكي، ومن ثم انخفاض نسب المسوق منها، بسبب مجموعة من العوامل الداخلية والخارجية التي تحيط بهذه المحاصيل اثناء سلسلة العمليات الانتاجية والتسويقية التي تمر بها تلك الحاصلات. ومن هذه العوامل ما يمكن التحكم بها والبعض الاخر لا يمكن التحكم به مما يجعل المحصول تحت وطأة هذه العوامل مجتمعة، الامر الذي يعد هدرا للموارد التي استخدمت في انتاجها فضلاً عن الخسائر المتحققة لكل من مزارعي ومسوقي هذه المحاصيل على حد سواء. استهدف البحث تحديد اهم العوامل والاسباب التي تؤدي الى هذا الفاقد من المحصولين في محافظة بغداد من خلال استخدام التحليل العاملي بنوعيه الاستكشافي والتوكيدي، ومن خلال اختيار عينة عشوائية لمزارعي ومسوقي المحصولين وتصميم استمارة استبيان خاصة لهؤلاء المنتجين لموسم حصاد 2021. أوضحت النتائج المقدرة ان نسب فواقد ما بعد الحصاد من محصولي النارنج واللالنكي على مستوى اصحاب البساتين قد بلغت نحو 17%، 38% لكل محصول على الترتيب، بينما بلغت نسب فواقد الطن المسوق حوالي 13%، 12% لكل منهما على الترتيب على مستوى باعة الجملة. اشارت النتائج المقدرة ايضا الى ان معامل الفقد الذي تم تحديده بالاعتماد على العوامل التي ساهمت في تكوينه، يتأثر بالدرجة الاولى بعامل عدم وجود مخازن مناسبة لخزن الحاصل في البستان بعد قطفه الذي احتل النسبة الاكبر في تكوينه على مستوى اصحاب البساتين بمقدار 91%، بينما كان عامل التاخر في عملية البيع لاصحاب التجزئة وباعة المفرد اهم عامل مؤثر في تقليل فاقد الحاصلات البستانية على مستوى باعة الجملة في الاسواق المحلية بنسبة 91%. ومن اجل حل المشاكل التسويقية وتقليل نسب الفواقد، اوصى البحث بضرورة الاهتمام بالحاصل بعد حصاده، من خلال اتباع اجراءات الخزن والنقل والتحميل والفرزعلى وفق اساليب علمية حديثة واستخدام التقانات الحديثة في كافة العمليات التسويقية بدءا من البستان مروراً بالاسواق وصولا الى مائدة المستهلك.

كلمات مفتاحية: فواقد ما بعد الحصاد، التحليل العاملي، محددات الفاقد، اشجار الفاكهة، محافظة بغداد.

المقدمة

يمثل الفاقد أثناء مراحل الإنتاج الزراعي وصولاً الى المستهلك النهائي رصيدا كبيرا من الفجوة الزراعية، إذ يعد الهدر خاصة الزراعي منه ظاهرة سلبية تحتاج إلى معالجة حقيقية يساهم فيها الجميع، سواء أكان فلاحا أو مرشدا زراعيا أو حتى الحكومة، إذ يؤثر الفاقد الذي لا يمكن تجنبه اقتصادياً، بشكل مباشر وسلبي على دخل المزارعين والمستهلكين على حد سواء، وبالنظر إلى أن العديد من أصحاب الحيازات هم من صغار المزارعين، فإن الحدّ منه قد يكون له تأثير فوري وكبير على سبل عيشهم، ولتقليل الفاقد الزراعي أو الحد منه لابد من تتبع أثره، وتتبع المراحل التي يتم فيها هذا الفاقد كمراحل الحصاد، والنقل، والتداول، والتخزين، والتسويق النهائي للمحصول (سيد واخرون، 2015).

يمثل خفض الفاقد من الاغذية عنصر مهم في معادلة الأمن الغذائي، وعلى هذا الاساس فإن خسائر ما بعد الحصاد هي خسائر كمية ونوعية قابلة للقياس في نظام ما بعد الحصاد، وهي الخسائر التي تحدث ما بعد الانتاج وللمراحل جميعها بدءا من الحصاد وتحركات الغذاء وصولاً الى نقطة الاستهلاك (Ali, and Jabara, 2021).

تعد حاصلات الفاكهة الاكثر عرضة للفقد خاصة خلال مرحلة ما بعد الحصاد نظرا الى كون غالبيتها محاصيل سريعة التلف بعد الحصاد وذات عمر تسويقي وتخزيني محدود، ويحدث الفاقد في حاصلات الفاكهة بعد حصادها كفاقد كمي يمكن قياسه

بإنخفاض الوزن أو الحجم, أو يمكن ان يكون فاقد نوعي مثل إنخفاض قيمة المغذيات والتغييرات غير المرغوب فيها مثل الذبول والكرمشة وفقدان اللمعان وتدهور جزء كبير من النكهة المميزة للمحصول (جورجي واخرون، 2011). وهناك طريقتان شائعتا الاستخدام في تقدير الخسائر الغذائية بعد الحصاد (Hodges, 2011):

الطريقة الاولى:- هي قياس الخسائر الفعلية من سلعة معينة من الانتاج الى الاستهلاك، من قياس الوزن و/ أو فقدان الجودة في كل مرحلة تمر بها. اذ يعد هذا المنهج أفضل تقدير لخسائر الغذاء، بالرغم من صعوبته بالنسبة لبعض السلع، وقد تم إستخدامه من قبل Harris و Lindblad (1978) كدليل تقييم خسارة الحبوب في أمريكا.

الطريقة الثانية:- هي إستخدام التقديرات من قبل أولئك الذين يعانون من خسائر الغذاء، وذلك باستخدام إستمارة إستبيان ومن تطبيق مقياس ليكرت، اذ تعد هذه الطريقة اسهل نسبياً على الرغم من صعوبة الوقائع المقدرة ذاتياً لخسائر السلع الغذائية، الا ان هذه الطريقة تم استخدامها في هذه الدراسة.

إن دراسة الفاقد الذي يحدث أثناء العملية الإنتاجية وتحليل اهم العوامل التي ادت اليه يسهم في الكشف عن الكيفية التي تستغل بها الموارد المستخدمة في العملية الانتاجية، بحيث يمكن عن طريقه معرفة ما إذا كانت هذه الموارد تستغل بكفاءة أم أن هناك إسراف في استخدامها ومن ثم يمكن اعتباره بمثابة مؤشر للحكم على مدى فعالية نظام الرقابة على استغلال تلك الموارد الإنتاجية (عليوي وكاظم، 2021).

مشكلة البحث

تعد مشكلة الفاقد في المنتجات الزراعية ومنها المحاصيل البستانية أحد المشكلات الرئيسة التي تواجه القطاع الزراعي في العراق التي يجب التغلب عليها، تحقيقا لاهداف السياسة الزراعية والنهوض بواقع القطاع الزراعي وزيادة الإنتاج كما ونوعا ورفع المستوى المعيشي للعاملين في هذا القطاع. أن تقليل نسبة الفاقد من الحاصلات الزراعية بصفة عامة والبستانية بصفة خاصة سواء خلال مرحلة الإنتاج أو ما يليها من معاملات ما بعد الحصاد والتسويق قد يعادل في جدواه الاقتصادية إستصلاح وزراعة مساحات كبيرة تستنزف الكثير من الموارد الإقتصادية والمائية. إلا أن هذا الجانب لم يلقى حتى الآن الاهتمام الكافي من القائمين على السياسة الزراعية أو من المشروعات التنموية الزراعية، الامر الذي يؤدي إلى زيادة حجم الفاقد ومن ثم إهدارا للموارد الإنتاجية المستخدمة في إنتاج تلك الحاصلات فضلا" عن الخسائر المتحققة لكل من المنتجين والوسطاء المسوقين لتلك المحاصيل على حدٍ سواء.

فرضية البحث

يفترض البحث ان هناك قصورا في مختلف الوظائف والخدمات التسويقية ما بعد الحصاد من فرز وتجميع وتخزين ونقل لحاصلات الفاكهة من اماكن تجميعها داخل المزرعة الى اماكن شرائها وبيعها في اسواق الجملة واسواق التجزئة، يتسبب بحدوث فقد وهدر في الكميات المنتجة منها الامر الذي ينعكس سلبا على الانتاجية ومن ثم على الاستغلال الكفؤ للموارد الاقتصادية التي استعملت في انتاج تلك الفاكهة.

هدف البحث

يهدف البحث الى تقدير كميات ونسب فواقد ما بعد الحصاد من محصولي اللالنكي والنارنج في محافظة بغداد على مستوى كل من اصحاب البساتين وباعة الجملة في الموسم الزراعي 2021، فضلاً عن توضيح وتحديد اهم العوامل والاسباب التي ادت الى هذا الفاقد في العينة المبحوثة من خلال استخدام التحليل العاملي بنوعيه الاستكشافي والتوكيدي.

المواد والطرائق

. عينة البحث

ومن اجل تحقيق هدف البحث فقد اعتمدت الدراسة على البيانات الاولية من واقع استمارات استبيان تم تصميمها من قبل الباحثين للحصول على البيانات المطلوبة، حيث قسمت الاستبانة الى قسمين رئيسين هما: القسم الاول اذ تضمن الخصائص الشخصية للمنتجيين (العمر، المؤهل العلمي، عدد سنوات الخبرة...الخ). في حين شمل القسم الثاني للاستبانة مجال الدراسة، شملت بيانات المسح الميداني نوعين من المنتجين لحاصلات النارنج واللانكي في محافظة بغداد تم اختيارهم بشكل عشوائي، وهم اصحاب البساتين (المنتجين) وبائعي الجملة، وتم جمع البيانات عن طريق المقابلة الشخصية مع خمسين مزارعا من اصحاب البساتين موزعين على الدوائر الزراعية التابعة لمحافظة بغداد، كما تم مقابلة خمسين وسيطاً من باعة الجملة في المحافظة نفسها.

. اسلوب البحث

اتبع البحث الاسلوب الوصفي والكمي الرياضي لتحديد العوامل التي تعمل على تحديد وتقليل الفاقد من المحاصيل البستانية، حيث تم إستخدام التحليل العاملي الاستكشافي والتوكيدي، وهو أسلوب إحصائي يستهدف تفسير معاملات الارتباطات الموجبة – التي لها دلالة أحصائية – بين المتغيرات المختلفة (العلي، 2018)، بمعنى آخر فإن التحليل العاملي عملية رياضية تستهدف تبسيط الارتباطات بين مختلف المتغيرات الداخلة في التحليل وصولا الى العوامل المشتركة التي تصف العلاقة بين هذه المتغيرات وتفسيرها (العلي، 2018). ويعتبر التحليل العاملي منهجاً إحصائيا لتحليل بيانات متعددة أرتبطت فيما بينها بدرجات مختلفة في صورة تصنيفات مستقلة قائمة على أسس نوعية للصنف ويتولى الباحث فحص هذه الاسس التصنيفية واستشفاف ما بينها من خصائص مشتركة وفقاً للاطار النظري والمنطق العلمي (العبد الله واخرون، 2020). اذ يعد التحليل العاملي أحد الاساليب الاحصائية التي تهدف الى تخفيض عدد المتغيرات أو البيانات المتعلقة بظاهرة معينة ويتم ذلك من بناء مجموعة جديدة من المتغيرات المحددة على العلاقات ومن ثم تحويلها لمجموعة من المكونات الاساسية التي لا ترتبط فيما بينها أرتباطاً عاليا (العبدالله، 2020). ويمثل التوفيق الافضل للمكونات الاساسية العامل الاول، كما يحدد التوفيق الافضل للمكونات الاساسية الثانية التي لم تحسب في العامل الاول لتحديد العامل الثاني، وهكذا لبقية العوامل، ويقسم التحليل العاملي الى قسمين هما (العبدالله، 2020 & عايش وعطية، 2009):

1.التحليل العاملي الاستكشافي: ويستخدم كثيرا في التطبيقات العملية وهو يقوم بدراسة العلاقات بين المتحولات عبر تلك النماذج دون أستخدام فرضيات مسبقة عنها، ثم يستخدم النتائج التي يتم التوصل اليها لاستكشاف العلاقات الموجودة بين تلك المتحولات، واستخلاص العوامل المؤثرة عليها، وبتحديد أكثر فهو يهتم بامكانية التوصل الى المتغيرات. أو هو أسلوب أحصائي يهدف الى إختزال عدد المتغيرات المكونة للمتغير الرئيس موضوع البحث أو الاهتمام بعدد أقل يسمى عوامل ويستخدم كاستراتيجية لتقليص عدد المتغيرات أو المؤشرات التي تستعمل لجمع البيانات مثل الاستبيان والكشف عن المساحة المشتركة من الدلالة أو المعنى (العلاقة) التي يشترك فيها القاسم المشترك، كما يعمل التحليل العاملي الاستكشافي على تقدير الصدق العاملي للكشف عن البنية العاملية (عدد العوامل، ونمط التشبعات للفقرات عليها) للمقياس المستخدم (بلبخاري وتيغزة، 2009). ويستخدم هذا النوع في الحالات التي تكون فيها العلاقات بين المتغيرات والعوامل الكامنة غير معروفة، ومن ثم فأن التحليل العاملي يهدف الى اكتشاف العوامل التي تصنف اليها المتغيرات.

2.التحليل العاملي التوكيدي: هو أجراء إحصائي متعدد المتغيرات يستخدم في إختبار الفروض التي تفترض بالضرورة وجود أنماط أو عوامل خاصة من العلاقات في البيانات يمكن على اساسها تصنيف المتغيرات. ويستخدم لاختبار جودة تمثيل

مجموعة من المتغيرات المشاهدة لعدد من المتغيرات الكامنة يرتبط باختبار النظريات ويستخدم في بناء المقاييس، التحقق من صدق المقاييس، أختبار أثر طريقة القياس واختبار عدم تغير البناء العاملي للمقياس عبر العينات المختلفة. ويتم استخدام هذا النوع من التحليل لتحديد ما اذا كان هناك عامل عام أو مجموعة من العوامل الفرعية وبالتالي يحدد كيفية تصحيح المقياس، وهل يتم استخدام الدرجة الكلية ام الدرجة على كل عامل فرعي، أم يمكن استخدام الدرجة الكلية والدرجة على العوامل الفرعية. ويتم استخدامه بالاعتماد على النتائج المتحصل عليها من التحليل العاملي الاستكشافي. فهذا النوع من التحليل يستخدم لاجل اختبار الفرضيات المتعلقة بوجود او عدم وجود علاقة بين المتغيرات والعوامل الكامنة كما يستخدم التحليل العاملي التوكيدي في تقييم قدرة نموذج العوامل على التعبير عن مجموعة البيانات الفعلية وكذلك في المقارنة بين عدة نماذج للعوامل بهذا المجال.

النتائج والمناقشة

اولا"// المؤشرات الانتاجية لمحصولي اللالنكي والنارنج:

كما يتضح من الجدول 1، بدراسة تطور كل من عدد الاشجار والانتاج لمحصول اللالنكي على مستوى العراق للمدة 2000 . 2019 ان عدد اشجار محصول اللالنكي تراوح بين حد ادنى بلغ حوالي 58100 شجرة للاعوام 2000 . 2004، وحد اقصى بلغ حوالي 305944 شجرة عام 2013، بمتوسط سنوي قدر بحوالي 209890 شجرة، وقد اتجه عدد اشجار اللالنكي نحو الزيادة خلال مدة الدراسة بمعدل نمو سنوي قدر على نحو 7%. كما تراوح الانتاج خلال المدة نفسها بين حد ادنى بلغ حوالي 300 طن عام 2004، وحد اقصى بلغ حوالي 28890 طن عام 2005، بمتوسط سنوي قدره 4111 طن، وقد اتجه الانتاج من محصول اللالنكي نحو الزيادة خلال مدة الدراسة بمعدل نمو سنوي قدر على نحو 5%.

كما يتبين من الجدول 1 ايضا، بدراسة تطور كل من عدد الاشجار والانتاج لمحصول النارنج على مستوى العراق للمدة 2000 . 2019 ان عدد اشجار محصول النارنج تراوح بين حد ادنى بلغ حوالي 44800 شجرة للاعوام 2001 . 2004، وحد اقصى بلغ حوالي 753329 شجرة عام 2019، بمتوسط سنوي قدر بحوالي 511781 شجرة، وقد اتجه عدد اشجار النارنج نحو الزيادة خلال مدة الدراسة بمعدل نمو سنوي قدر على نحو 15%. كما تراوح الانتاج خلال المدة نفسها بين حد ادنى بلغ حوالي 800 طن عام 2004، وحد اقصى بلغ حوالي 21498 طن عام 2019، بمتوسط سنوي قدره 9953 طن، وقد اتجه انتاج محصول النارنج نحو الزيادة خلال مدة الدراسة بمعدل نمو سنوي قدر على نحو 17%.

جدول 1. تطور اعداد الاشجار المثمرة والانتاج لاشجار اللالنكي والنارنج في العراق للمدة (2000 . 2019)

السنوات	اشجار محصول اللالنكي			اشجار محصول النارنج		
	عدد الاشجار	كمية الانتاج/ طن	الانتاجية/ كغم	عدد الاشجار	كمية الانتاج/ طن	الانتاجية/ كغم
2000	58100	1480	25	44900	1200	27
2001	58100	1500	26	44800	1190	27
2002	58100	1510	26	44800	1170	26
2003	58100	630	14	44800	910	16
2004	58100	300	12	44800	800	13
2005	244600	28890	11	613900	6805	11
2006	262600	2800	11	647900	7100	11
2007	284137	2938	10	656234	6788	10
2008	275714	3327	12	664955	7946	12
2009	283845	3675	13	674075	8656	13
2010	293043	3668	13	683569	8586	13
2011	303953	3530	12	690587	11066	16
2012	304311	3578	12	703666	13019	19
2013	305944	4437	15	714182	17132	24
2014	304167	4670	15	703722	17838	25
2015	202751	2675	13	619068	16042	26
2016	203111	2711	13	622447	16886	27
2017	202611	2743	14	629094	17025	27
2018	202401	2990	15	634796	17393	27
2019	234291	4167	18	753329	21498	29
***مجموع المدة**	**4197979**	**82219**	**.**	**10235624**	**199050**	**.**
***متوسط المدة**	**209890**	**4111**	**15**	**511781**	**9953**	**20**

*معدل النمو السنوي	0.075	0.054	- 0.014	0.153	0.173	0.025

المصدر// وزارة الزراعة/ دائرة التخطيط والمتابعة. *حسبت من قبل الباحثين استنادا" الى نتائج البرنامج الاحصائي SPSS.

ثانيا"// حساب نسبة فواقد ما بعد الحصاد ومحدداتها لمحصولي النارنج واللالتكي على مستوى اصحاب البساتين:

توضح البيانات الواردة في الجدول 2 ان معدل اجمالي المساحة المزروعة بمحصولي اللالنكي والنارنج لعينة الدراسة بلغ نحو 22، 18.8 دونم لكل منهما على الترتيب، واوضحت النتائج ان اصحاب بساتين العينة المختارة قد خسروا وفقا لحساباتهم ما يقدر بنحو 38%، 17% كفاقد من معدل الانتاج الكلي المتوقع لمحصولي اللالنكي والنارنج والمقدر بنحو 14.4، 19.7 طن لكل منهما على الترتيب. هذا وقد بلغ معدل اجمالي الكميات المفقودة من محصولي اللالنكي والنارنج حوالي 5.5، 3.3 طن لكل منهما على الترتيب.

جدول 2: كمية ونسبة الفقد لمحصولي النارنج واللالنكي ما بعد الحصاد على مستوى اصحاب البساتين

المحصول	معدل المساحة/دونم	معدل الانتاجية طن	معدل الانتاج المتوقع /طن	معدل الانتاج المسوق /طن	معدل كمية الفاقد/طن	نسبة الفاقد %
النارنج	18.8	1.05	19.7	16.4	3.3	17
اللالنكي	22.02	0.654	14.4	8.9	5.5	38

المصدر// نظم واحتسب من قبل الباحثين بالاعتماد على استمارة الاستبانة للمسح الميداني وحسب المعادلات التالية:

معدل كمية الفقد = معدل الانتاج المتوقع – معدل الانتاج المسوق من المحصول

معدل الانتاج المتوقع = معدل المساحة المزروعة بالمحصول x معدل الانتاجية الفعلية للمحصول

النسبة المئوية للفقد = (معدل كمية الفقد / معدل الانتاج المتوقع) x 100

وللوقوف على اهم المحددات والعوامل التي ادت الى تلك الخسائر وفواقد ما بعد الحصاد لمحصولي النارنج واللالنكي في محافظة بغداد، تم إستخدام التحليل العاملي بنوعيه (الاستكشافي والتوكيدي) وبمساعدة الحزمة الاحصائية الجاهزة للبرنامج SPSS وبرنامج AMOS، وقد تم الحصول على النتائج الموضحة في الجداول 3 و4 و5.

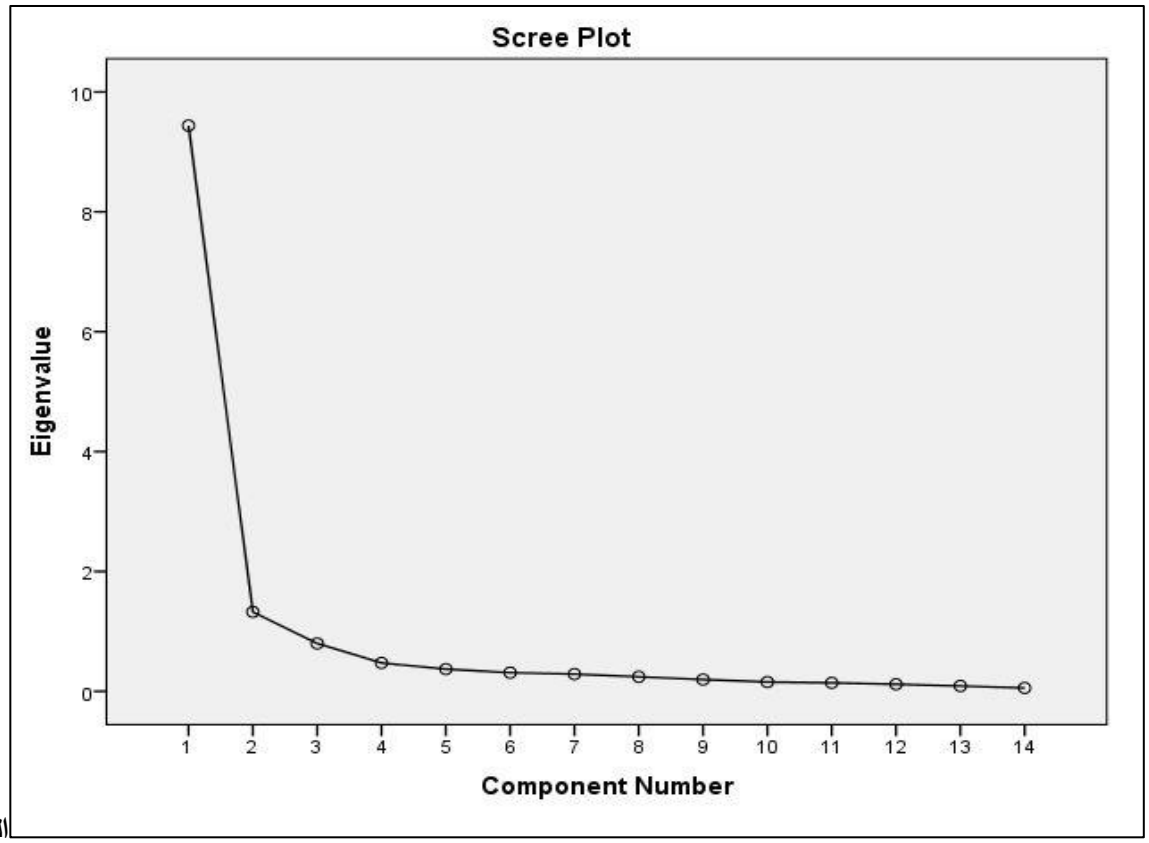
بدراسة العوامل التي تحدد فاقد ما بعد الحصاد لمحصولي النارنج واللالنكي في محافظة بغداد لعينة الدراسة لموسم حصاد 2021، تبين النتائج المعروضة في الجدول 3 ان هناك اربعة عشر متغير على مستوى البساتين، شملت كل من (الاصابة بالامراض والحشرات، سوء الخزن في البستان بسبب عدم وجود مخازن واجهزة متطورة ومناسبة للخزن، تعرض الحاصل للبرودة الشديدة، تشوه الثمار وصغر حجمها، سوء عملية القطف، مشاكل التحميل والتفريغ، زيادة درجة نضوج الثمار، وضع الحاصل في عبوات غير مناسبة، موعد الجني غير ملائم، ضعف الجانب الارشادي، ضعف في عملية القطف اي سوء الجانب الفني، وضعف عمليات الفرز والتدريج). اذ يوضح الجداول 3 ان المتوسطات الحسابية لجميع العبارات كانت تتراوح بين (1.4- 2.8) وهي قيم تدل بحسب مقياس ليكرت الثلاثي على ان الفقد كان يتراوح بين الفقد المتوسط، والفقد الكبير وكان الوسط الحسابي لاجابات افراد العينة 2.8 كاعلى قيمة إذ ان الدرجة التي يحصل عليها افراد العينة هي ثلاث درجات مما يؤكد على الاهتمام من اصحاب البساتين لتقليل هذه الخسارة وكان عامل (انعدم وجود مخازن مناسبة للخزن) هو من حصل على اعلى وسط حسابي، واقل قيمة كانت 1.4 وهو عامل زيادة درجة نضج الثمار.

جدول3: التحليل الوصفي لاسباب الفقد من محصولي النارنج واللالنكي على وفق اراء اصحاب البساتين

ت	العبارة	الاتجاهات						الوسط الحسابي	الانحراف المعياري
		اتفق (1)		محايد (2)		لا اتفق (3)			
		العدد	%	العدد	%	العدد	%		
1	سوء عملية القطف من جانب العمال	4	8	2	4	44	88	2.2	0.78
2	قلة الاهتمام بعمليات خدمة المحصول ومواعيد الحصاد	15	30	3	6	32	64	1.9	0.82
3	قلة الاهتمام بعمليات الخزن والفرز	10	20	6	12	34	68	2.3	0.79
4	الاصابة بالامراض والحشرات	38	76	3	6	9	18	1.5	0.56
5	زيادة درجة نضج الثمار	14	28	4	8	32	64	1.4	0.57
6	وضع الحاصل في عبوات غير مناسبة	12	24	4	8	34	68	1.7	0.85
7	تعرض الحاصل للبرودة الشديدة (سوء الخزن)	19	38	4	8	27	54	1.8	0.86
8	سوء الاحوال الجوية اثناء وبعد الحصاد	6	12	3	6	41	82	2.3	0.72
9	مشاكل التحميل ونقل الحاصل الى الاسواق الجملة	16	32	3	6	31	62	2.3	0.73
10	سقوط الثمار اثناء عملية القطف والجني لاسباب فنية	10	20	5	10	35	70	2.4	0.77
11	انعدام وجود مخازن مناسبة لخزن الحاصل في البستان	11	22	4	8	35	70	2.8	0.53
12	تشوه الثمار وصغر حجمها	19	38	5	10	26	52	2.1	0.93
13	ضعف في عملية التعبئة	15	30	5	10	30	60	1.9	0.95
14	ضعف الجانب الارشادي لخدمات ما بعد الحصاد	12	24	1	2	37	74	2	0.88

المصدر// نظم واحتسب من قبل الباحثين بالاعتماد على بيانات استمارة الاستبانة للعينة المبحوثة

ويوضح الشكل 1 التحليل العاملي الاستكشافي لاسباب الخسائر والفقد على مستوى اصحاب البساتين للعينة المبحوثة. بالنظر الى الشكل 1، اذ يتبين ان عامل انعدم وجود مخازن مناسبة لخزن الحاصل في البستان بعد حصاده (عامل 11) هو اهم عامل مؤثر في تقليل فاقد الحاصلات البستانية بعد الحصاد.



الشكل 1: التحليل العاملي الاستكشافي لاسباب الفقد على مستوى اصحاب بساتين النارنج واللالنكي في بغداد

المصدر// تم رسمه وحسابه بالاعتماد على بيانات الجدول 2 وباستخدام البرنامج الاحصائي SPSS

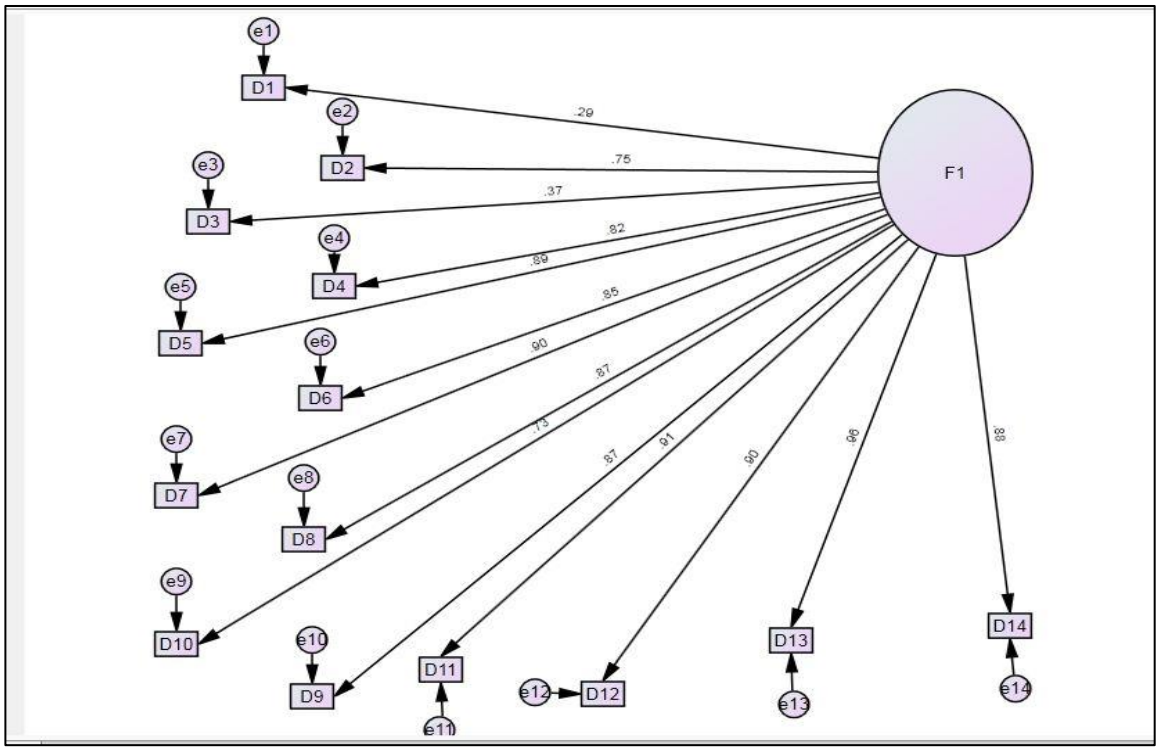
وتبين النتائج المعروضة في الجدول 4 الذي يشير الى قيم الشيوع لفاقد ما بعد الحصاد لاصحاب بساتين النارنج واللالنكي، ان معامل الفقد (F1) الذي تم تحديده بالاعتماد على العوامل التي ساهمت في تكوينه، يتأثر بالدرجة الاولى بعامل (عدم وجود مخازن مناسبة لخزن الحاصل في البستان بعد قطفه) الذي احتل النسبة الاكبر في تكوينه بمقدار 91% وباشارة موجبة، اي ان العلاقة بين نسبة الفقد وعدم وجود مخازن مناسبة لخزن الحاصل في البستان تكون طردية، اي كلما انعدم وجود المخازن المناسبة للخزن كلما ادى ذلك الى زيادة نسبة الفقد في المحاصيل البستانية، يليها عامل سوء الاحوال الجوية اثناء وبعد الحصاد وتعرض المحاصيل الى البرودة الشديده بنسبة 90% وكانت باشارة موجبة ايضا للدلالة على العلاقة الطردية بين نسبة الفقد وسوء الاحوال الجوية، وهذا يعني كلما تزداد البردوه كلما يؤدي ذلك الى زيادة نسبة الفقد، اما عامل ضعف الجانب الارشادي لخدمات ما بعد الحصاد فكانت نسبته 88% وجاء باشارة موجبة ايضا اي كلما ضعف الجانب الارشادي الموجه الى اصحاب البساتين حول اهمية الحفاظ على المحصول بعد الحصاد، كلما يؤدي ذلك الى زيادة الفقد لمحصولي النارنج واللانكي على مستوى البستان، كذلك الضعف في عملية التعبئة وقلة الاهتمام بعمايات الفرز والتدريج جاءت بنسبة 87% وباشارة موجبة، اي كلما كانت عملية الفرز والتدريج والتعبئة ضعيفة وسيئة كلما ادى ذلك الى زيادة نسبة الفقد، وجاء عامل وضع الحاصل في عبوات غير مناسبة بنسبة 85% وباشارة موجبة اي العلاقة طردية وكبيرة بين زيادة الفقد ووضع الحاصلات في عبوات غير مناسبة. وظهر اقل العوامل تأثيراً في الفقد في محصولي النارنج واللالنكي لعينة البحث هو زيادة درجة نضج الثمار وسقوط الثمار اثناء عملية القطف والجني بنسبة 29%، 37% لكل منهم على الترتيب.

جدول 4: قيم الشيوع لفاقد ما بعد الحصاد لاصحاب بساتين النارنج واللانكي لعينة الدراسة

ت	المتغيرات	Initial	Component
1	سوء عملية القطف من جانب العمال	1	0.75
2	قلة الاهتمام بعمليات خدمة المحصول ومواعيد الحصاد	1	0.60
3	قلة الاهتمام بعمليات الخزن والفرز	1	0.87
4	الاصابة بالامراض والحشرات	1	0.59
5	زيادة درجة نضج الثمار	1	0.29
6	وضع الحاصل في عبوات غير مناسبة	1	0.85
7	تعرض الحاصل للبرودة الشديدة (سوء الخزن)	1	0.90
8	سوء الاحوال الجوية اثناء وبعد الحصاد	1	0.90
9	مشاكل التحميل ونقل الحاصل الى الاسواق الجملة	1	0.79
10	سقوط الثمار اثناء عملية القطف والجني لاسباب فنية	1	0.37
11	انعدام وجود مخازن مناسبة لخزن الحاصل في البستان	1	0.91
12	تشوه الثمار وصغر حجمها	1	0.82
13	ضعف في عملية التعبئة	1	0.87
14	ضعف الجانب الارشادي لخدمات ما بعد الحصاد	1	0.88

المصدر// نظم واحتسب من قبل الباحثين بالاعتماد على بيانات استمارة الاستبانة للعينة المبحوثة وباستخدام برنامج SPSS

ويوضح الشكل 2، (الذي يشير الى التحليل العاملي التوكيدي لفاقد اصحاب البساتين لحاصلاتهم البستانية ما بعد حصادها، والذي تم رسمه وحسابه بالاعتماد على الجدول 4 وباستخدام البرنامج الاحصائي AMOS)، درجة مساهمة كل متغير من متغيرات فاقد الحاصلات البستانية لمالكين بساتين النارنج واللالنكي في محافظة بغداد في تكوين العامل الرئيسي لفاقد الحاصلات البستانية.



الشكل 2: التحليل العاملي التوكيدي لاسباب الفقد على مستوى اصحاب بساتين النارنج واللالنكي في بغداد

المصدر// تم رسمه وحسابه بالاعتماد على بيانات الجدول 3 وباستخدام البرنامج الاحصائي AMOS

وبالنظر الى الجدول 5 نلاحظ ان أنموذج معامل الفقد لاصحاب البساتين يتمتع بمؤشرات مطابقة جيدة، حيث ان من اهم المؤشرات التي تستخدم للحكم على مدى مطابقة الانموذج في التحليل العاملي التوكيدي هو اختبار كاي سكوير (chi–square) وكانت قيمته 720.045 وبدرجات حرية df= 91، اي غير دالة احصائياً (غير معنوية)، كذلك كانت قيمة جودة النموذج TLI=0.90، CFI=0.91، GFI=0.91، حيث كانت جميعها مرتفعة اكبر من 0.90 وكذلك مؤشر RMSEA < 0.08 ، حيث ظهرت نسبته حوالي 0.075 اي ان النموذج ملائم ومطابق للبيانات.

جدول 5: مؤشرات المطابقة لانموذج معامل فاقد ما بعد الحصاد لاصحاب بساتين النارنج واللالنكي للعينة

المؤشر	حدود الثقة أو المدى المثالي	القيمة
Chi–square	أن تكون قيمته غير دالة احصائية	720.045
Df	–	91
Chi–square/df	لا تتعدى 0.05	0.071
RMSEA	0.08 – 0	0.075
RFI	0.9 –1	0.91
RMR	اقل من 0.1	0.08
TLI	0.9 –1	0.90
GFI	0.9 –1	0.91
CFI	0.9 –1	0.91

المصدر// تم حسابه باستخدام برنامج AMOS

ثالثا"// حساب نسبة فواقد ما بعد الحصاد ومحدداتها لمحصولي النارنج واللالنكي على مستوى باعة الجملة:

أما بدراسة فاقد محصولي النارنج واللالنكي لمحافظة بغداد للموسم 2021 على مستوى باعة الجملة (اسواق الجملة)، تشير النتائج المعروضة في الجدول 6 الى ان معدل الكمية المشتراة من قبل باعة الجملة لعينة الدراسة بلغ حوالي 10.5، 32.3 طن لكل من المحصولين على الترتيب وبلغت نسبة الفقد والهدر لهذين المحصولين حوالي 13%، 12% لكل منهما على الترتيب نفسه.

جدول 6: كمية ونسبة الفقد والهدر بعد الحصاد لمحصولي النارنج واللالنكي على مستوى باعة الجملة

المحصول	معدل الكمية المشتراة/ طن	معدل الكمية المباعة /طن	معدل كمية الفقد /طن	نسبة الفقد %
النارنج	10.5	9.1	1.4	13
اللانكي	32.3	28.4	3.9	12

المصدر// نظم واحتسب من قبل الباحثين بالاعتماد على استمارة الاستبانة للمسح الميداني وحسب المعادلات التالية:

النسبة المئوية للفقد = (معدل كمية الفقد / معدل الكمية المشتراة) x 100

معدل كمية الفقد = معدل الكمية المشتراة – معدل الكمية المباعة من المحصول

وللوقوف على اهم المحددات والعوامل التي ادت الى تلك الخسائر وفواقد ما بعد الحصاد لمحصولي النارنج واللالنكي على مستوى باعة الجملة للعينة المبحوثة، تم إستخدام التحليل العاملي بنوعيه (الاستكشافي والتوكيدي) وبمساعدة الحزمة الاحصائية الجاهزة للبرنامج SPSS وبرنامج AMOS، وقد تم الحصول على النتائج الموضحة في الجداول 7 و8 و9.

اذ تبين النتائج الموضحة في الجدول 7 وجهات نظر باعة الجملة حول الاسباب المؤدية لذلك الفقد في المحاصيل البستانية كالنارنج واللالنكي، والتحليل الوصفي لهذه الاسباب من خلال استخراج الوسط الحسابي والانحراف المعياري باستخدام مقياس ليكرت الثلاثي والبرنامج الاحصائي SPSS، وكانت هناك ثمانية عوامل مهمة ادت الى حصول هذا الفقد وهي حسب ترتيبها على وفق اهميتها في التأثير: عامل التاخر في عملية البيع لاصحاب التجزئة (باعة المفرد)، سوء شبكات طرق النقل، نقل المحاصيل البستانية كان يتم بواسطة سيارات مكشوفة وغير مجهزة بوسائل حفظ حديثة ومتطورة وتعرض الحاصل للبرودة الشديدة بسبب سوء الخزن، استخدام عبوات غير مناسبة لنقل الحاصل الى السوق من قبل اصحاب البساتين، ضعف عملية التحميل والتفريغ للمحصول اثناء النقل، ضعف عمليات الفرز والتدريج من قبل صاحب البستان، فضلا عن تعرض محصولي النارنج واللالنكي الى ظروف جوية غير ملائمة داخل السوق بسبب العرض المكشوف.

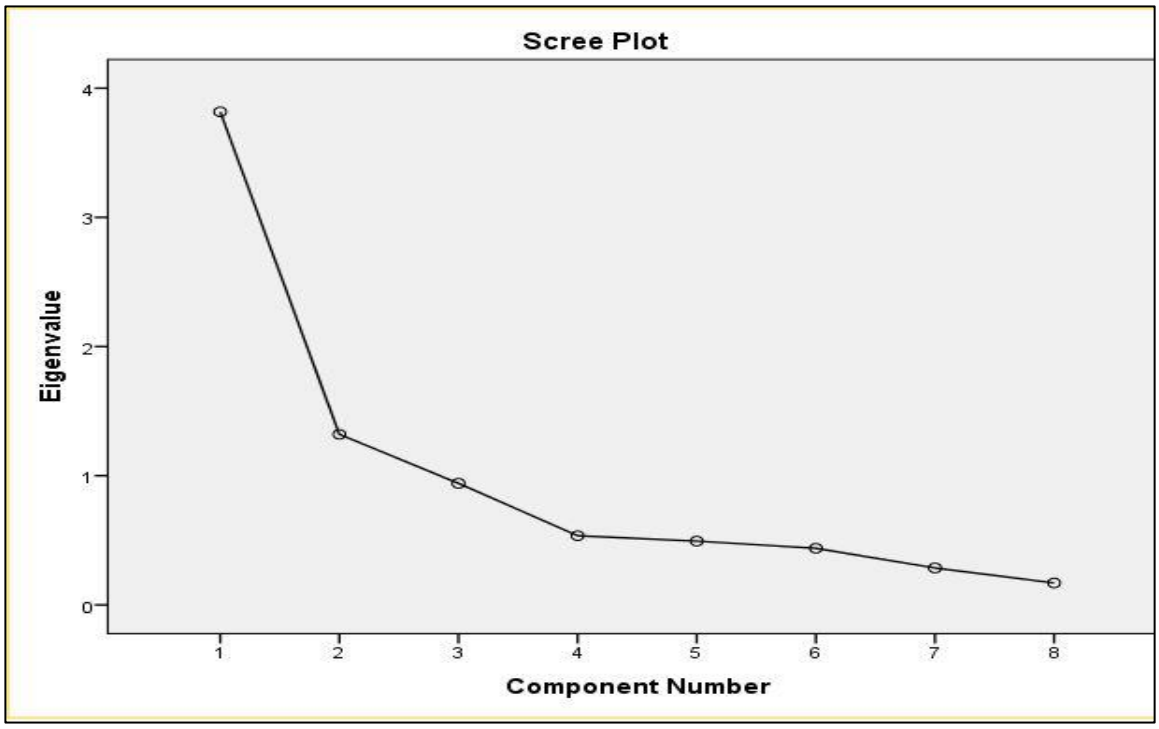
جدول 7: التحليل الوصفي لاسباب الفقد في النارنج واللالنكي على وفق اراء باعة الجملة للعينة المبحوثة

ت	العبارة	الاتجاهات						الوسط الحسابي	الانحراف المعياري
		اتفق (1)		محايد (2)		لا اتفق (3)			
		العدد	%	العدد	%	العدد	%		
1	عدم ملائمة العبوات المحملة بالمحصول	4	8	2	4	44	88	2.5	0.69
2	ضعف عمليات الفرز والتدريج من قبل المزارع	15	30	3	6	32	64	2	0.89
3	ضعف عملية التحميل والتفريغ	10	20	6	12	34	68	2.1	0.81

4	ضعف شبكات النقل	38	76	3	6	9	18	2.8	0.56
5	عدم تجهيز وسائل نقل المحصول بآلات حفظ حديثة ومنطورة	14	28	4	8	32	64	2.7	0.60
6	العرض المكشوف والتعرض للظروف الجوية غير الملائمة	12	24	4	8	34	68	1.8	0.66
7	تعرض الحاصل للبرودة الشديدة (سوء الخزن)	19	38	4	8	27	54	2.7	0.54
8	ضعف عملية البيع لاصحاب باعة التجزئة	6	12	3	6	41	82	2.9	0.35

المصدر// نظم واحتسب من قبل الباحثين بالاعتماد على بيانات استمارة الاستبانة للعينة المبحوثة

ويبين الشكل البياني 3 التحليل العاملي الاستكشافي لاسباب الفقد والهدر لمحصولي النارنج واللالنكي على مستوى الاسواق في محافظة بغداد، اذ يتضح ان عامل التاخر في عملية البيع لاصحاب التجزئة او باعة المفرد هو اهم عامل مؤثر في تقليل فاقد الحاصلات البستانية على مستوى باعة الجملة في الاسواق المحلية.



الشكل 3: التحليل العاملي الاستكشافي لاسباب الفاقد على مستوى باعة الجملة في محافظة بغداد

المصدر// تم رسمه وحسابه بالاعتماد على بيانات الجدول 6 وباستخدام البرنامج الاحصائي SPSS

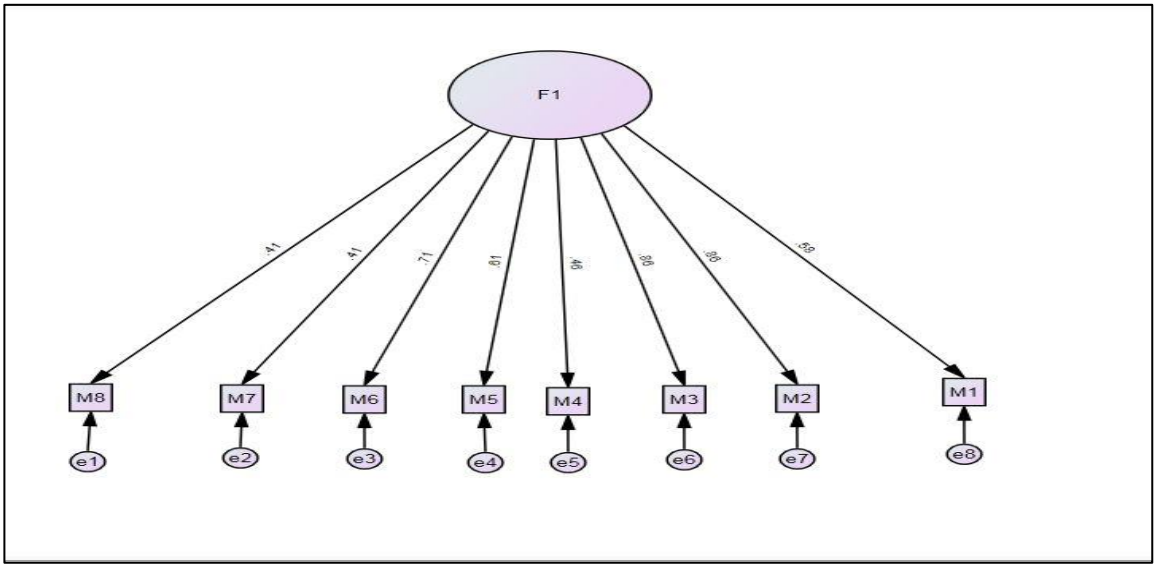
وتوضح نتائج الجدول 8 تشبعات المعاملات (الفقرات) على العامل (F1) الذي هو معامل الفقد وكان اهمها ضعف عملية البيع لاصحاب باعة التجزئة وكان هذا العامل الاول بنسبة 91%، ثم ياتي بعده عامل مهم جدا وهوضعف عملية التحميل والتفريغ اثناء تسويق المحصولين من والى السوق بنسبة 88%، يليها عامل عدم تجهيز وسائل نقل المحصوليين بآلات حفظ حديثة ومتطورة بنسبة 86%، وبعدها عامل تعرض المحاصيل البستانية لظروف جوية غير ملائمة داخل السوق بسبب العرض المكشوف بنسبة 75%، واخيرا ظهر العاملين وهما ضعف عمليات الفرز والتدريج وتعرض الحاصلات للبرودة الشديدة (النارنج واللانكي) بنسبة 40%.

جدول 8: قيم الشيوع لفاقد ما بعد الحصاد لسوق الجملة لمحصولي النارنج واللالنكي لعينة الدراسة

ت	المتغيرات	initial	Component
1	عدم ملائمة العبوات المحملة بالمحصول	1	0.55
2	عدم تجهيز وسائل نقل المحصول بآلات حفظ حديثة ومتطورة	1	0.86
3	ضعف عملية التحميل والتفريغ	1	0.88
4	ضعف شبكات النقل	1	0.46
5	ضعف عملية البيع لاصحاب باعة التجزئة	1	0.91
6	العرض المكشوف والتعرض للظروف الجوية غير الملائمة	1	0.75
7	ضعف عمليات الفرز والتدريج من قبل المزارع	1	0.41
8	تعرض الحاصل للبرودة الشديدة (سوء الخزن)	1	0.40

المصدر// نظم واحتسب من قبل الباحثين بالاعتماد على بيانات استمارة الاستبانة للعينة المبحوثة وباستخدام برنامج SPSS

ويوضح الشكل 4، درجة مساهمة كل متغير من متغيرات فاقد الحاصلات البستانية على مستوى باعة الجملة في محافظة بغداد في تكوين العامل الرئيسي لفاقد الحاصلات البستانية. اذ يلاحظ أن معامل الفقد (F1) تم تحديده على وفق اهم العوامل التي ساهمت في تكوينه والتي تم الاشارة اليها في الجدولين 7 و8. اذ يتبين ان العامل الخامس، وهو النقل حيث يتم بوسائط نقل غير ملائمة لنقل الحاصلات البستانية حيث كانت مكشوفة وغير مجهزة بوسائل حفظ حديثة، هو العامل الاول بنسبة 91% ومن ثم ياتي بعدها تتابع كل من العامل الثالث والثاني والسادس والعامل الاول وجاء العاملين السابع الثامن بالمرتبة الاخيرة بنسبة 41%.



الشكل 4: التحليل العاملي التوكيدي لاسباب الفقد على مستوى باعة الجملة في محافظة بغداد

المصدر// تم رسمه وحسابه بالاعتماد على بيانات الجدول 7 وباستخدام البرنامج الاحصائي AMOS

ومن خلال النتائج المعروضة في الجدول 9 نلاحظ ان الانموذج يتمتع بمؤشرات مطابقة جيدة من خلال مؤشرات TLI,GFI,CFI حيث كانت جميعها مرتفعة اكبر من 0.90 وكذلك مؤشر RMSEA كان اقل من 0.08 حيث كانت نسبته 0.078، فضلا عن مؤشر اختبار كاي سكوير chi–square اذ بلغت قيمته 33.44 وبدرجات حرية df مساوية الى 18. اذن كانت أدلة الصدق البنائي لنتائج التحليل العاملي التوكيدي لانموذج فاقد ما بعد الحصاد على مستوى باعة الجملة تدل على مدى تطابق النموذج مع البيانات.

جدول 9: مؤشرات المطابقة لانموذج معامل فاقد ما بعد الحصاد على مستوى باعة الجملة لعينة الدراسة

المؤشر	حدود الثقة أو المدى المثالي	القيمة
Chi-square	أن تكون قيمته غير دالة احصائية	33.44
Df	-	18
Chi-square/df	لا تتعدى 0.05	0.061
RMSEA	0.08 – 0	0.078
RFI	0.9 -1	0.90
RMR	اقل من 0.1	0.083
TLI	0.9 -1	0.93
GFI	0.9 -1	0.94
CFI	0.9 -1	0.92

المصدر// تم حسابه باستخدام برنامج AMOS

الاستنتاجات

1. اتضح ان للعبوات والحاويات المخصصة لوضع المحصول بعد حصاده، تاثير كبير في تقليل الفقد في المحاصيل البستانية، وحسب ما اظهرته نتائج الدراسة بوجود علاقة طردية قوية بين نسبة الفقد والهدر وبين العبوات المستخدمة لتحميل ونقل المحصولين النارنج واللالنكي الى اسواق الجملة.
2. اتضح ان نقل المحاصيل البستانية يتم بوسائل نقل غير ملائمة لنقل الحاصلات البستانية ، مما يعرضها للفقد والهدر، حيث تكون مكشوفة وغير مجهزة بوسائل حفظ حديثة ومتطورة.
3. حسب ما اظهرته نتائج التحليل العاملي الاستكشافي والتوكيدي وجود علاقة طردية قوية بين نسبة الفقد وانعدام وجود مخازن ملائمة لحفظ المحصولين النارنج واللالنكي في البستان، مما يعني عدم الاهتمام بالحفاظ على المحصول بعد حصاده وخصوصا على مستوى المزارع، وعدم وضعه في مخازن مناسبة له لتقليل الفقد.
4. تبين وجود علاقة طردية قوية بين نسبة الفقد ما بعد الحصاد والاحوال والظروف الجوية المناسبة لحصاد المحاصيل البستانية، مما يعني عدم الاهتمام باوقات الحصاد، وحصاد المحصول في الاوقات التي تكون فيها الاحوال الجوية غير جيدة وملائمة لحصاده.

التوصيات

1. الاهتمام بالحاصل بعد حصاده، من خلال اتباع اجراءات الخزن والنقل والتحميل والفرزعلى وفق اساليب علمية حديثة واستخدام التقانات الحديثة في كافة العمليات التسويقية بدءا من البستان مروراً بالاسواق وصولا الى مائدة المستهلك.
2. العمل على إنشاء مخازن في الحقل للحفاظ على المحصول بعد حصاده وقبل تسويقه على ان تتوفر في هذه المخازن كل الوسائل وشروط الخزن الصحيح للفاكهة.
3. الاهتمام بعمليات الفرز والتعبئة والتدريج للحاصل وفقا لاساليب علمية حديثة قبل نقله الى اسواق الجملة.
4. الاهتمام بوسائل نقل المحصول من البستان الى السوق ويفضل ان تكون وسائل نقل خاصة بنقل المحاصيل البستانية وان تكون مبردة وغير مكشوفة.

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"Use of Exploratory and Confirmatory Factor Analysis to Determine the Most Important Factors Affecting the Post-Harvest Losses of Horticultural Crops in Iraq (Mandarin and Bitter Orange Trees as an Applied Research Model)"

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Abstract

The agricultural sector in Iraq suffers from the phenomenon of increasing rates of losses in most winter and summer horticultural crops, including the bitter orange and mandarin crops, and then the low rates of marketed ones, due to a group of internal and external factors that surround these crops during the chain of production and marketing processes that these crops go through. Some of these factors can be controlled and others cannot be controlled, which makes the crop under the weight of these factors combined, which is a waste of the resources that were used in their production as well as the losses incurred by both farmers and marketers of these crops alike. The research aimed to determine the most important factors and reasons that lead to this loss of crops in Baghdad province through the use of factor analysis of its two types, exploratory and confirmatory, and by selecting a random sample of farmers and marketers of the crops and designing a special questionnaire form for these producers for the 2021 harvest season. The estimated results showed that the percentages of post-harvest losses of bitter orange and mandarin crops at the level of orchard owners amounted to about 17% and 38% for each crop, respectively, while the percentages of losses of marketed ton reached about 13% and 12% for each of them, respectively, at the level of wholesalers. . The estimated results also indicated that the coefficient of loss, which was determined depending on the factors that contributed to its formation, is affected primarily by the factor of the lack of suitable stores to store the crop in the orchard after harvesting, which occupied the largest percentage of its composition at the level of orchard owners by 91%, while the factor of the

delay in the sales process to retail owners and single sellers is the most important factor affecting in reducing the loss of horticultural crops at the level of wholesalers in the local markets by 91%. In order to solve marketing problems and reduce loss rates, the research recommended the need to pay attention to the harvest after harvesting, by following the procedures of storage, transport, loading and sorting according to modern scientific methods and the use of modern technologies in all marketing operations starting from the orchard through the markets to the consumer's table.

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"تحولات النظام الرأسمالي من الكلاسيكية الى الكينزية بين الأسباب وعوامل الإستمرار في العصر الحديث"

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المستخلص

يعد كينز كمنقذ للنظام الرأسمالي واوصى بأعتماد مبدأ المرونة في فسح المجال لتدخل الدولة في معالجة أزمة عام 1929 بعد تفاقمهافي المجتمع, ذلك لقدرتها وامكاناتها الكبيرة بما تملكه من رؤوس اموال وسلطة عامة على الافراد, وقد اعتمدت توصيات كينز الخاصة بتفعيل الطلب واعادة تشغيل الإيدي العاملة في الإقتصاد, وفعلاً تم ذلك وتوصل النظام الرأسمالي الى الحل الأمثل في معالجة أزمة الكساد الكبير بفضل أفكار الإقتصادي كينز, وقد اعتمدت هذه الدراسة بالتحليل والتوضيح تلك التحولات وأهميتها في إدامة النظريات الإقتصادية دون الإخلال بها, اذ قسم البحث على ثلاث محاور جاء المحور الأول منه بالاطار النظري للمدرسة الكلاسيكية والمدرسة الكينزية, ثم المحور الثاني الذي تطرق الى اهم الازمات التي تعرض لها النظام الرأسمالي الكلاسيكي وآلية التحول على وفق المنهج الكينزي, في حين جاء المحور الثالث بأهم الاستنتاجات والتوصيات, وقد توصل البحث الى ان أصبحت مهام الدولة تدخلية ولم تعد حارسة فقط, كان لابد من احداث تحولات في الفكر الكلاسيكي من خلال النظرية الكينزية. كانت الدورات الاقتصادية ذات نهايات شديدة الانحدار كما كانت في أزمة الكساد الكبير في 1929, وما تبعها من تحولات في النظرية الرأسمالية ذاتها، اماعند اعتماد النظرية الكنزية لحل الأزمة فقد أصبحت نهاياتها العليا (فترات الانتعاش) ونهاياتها الدنيا (فترات الكساد) اقل شدة وتأثيرا في الحياة الاقتصادية. اما التوصيات فهي من الضروري اتباع المرونة في أي منهج اقتصادي من أجل ضمان الوصول الى الاهداف وتحقيقها بشكل جيد.

الكلمات المفتاحية : تحولات النظام الرأسمالي , الكينزية , عوامل الإستمرار.

المقدمة

يقوم النظام الرأسمالي على مبدأ الحرية الاقتصادية، وينحسر دور الدولة في كونها حارسة ومشرعة ومنظمة ومقدمة للخدمات العامة الرئيسة التي لا يلج اليها القطاع الخاص والتي ليست من اختصاصه وتنازل عنها جموع الجمهور لصالح الدولة من خلال عقد اجتماعي معروف عرفاً وغير موثق كباقي العقود، وهي: الدفاع والأمن والقضاء والتمثيل الخارجي، ولا تتدخل بصورة مباشرة في النشاط الاقتصادي،

هذا المنطق يجعل الموازنة العامة للدولة متوازنة (حيادية) غير تدخلية فيكون دور الدولة متفرجا ليرى كيف ان قوى السوق تعيد التوازن تلقائيا الى الاقتصاد، عليه فان ادوات السياسة المالية في التأثير على جانبي العرض والطلب معطلة .

الا انه وبعد حدوث خلل في التوازن وظهور النقص الحاصل في الانفاق الخاص وضرورة خلق دخول موزعة للافراد, من خلال تشغيل العاطلين ولو بأعمال ثانوية غير منتجة بما يؤدي الى دفع الطلب الكلي الى الاعلى ومايتبعه من خلق طلب على منتجات المعامل المعطلة لتعيد فتح أبوابها واستيعاب العمال المسرحين من جديد واعطاءهم دخول تذهب للأنفاق وتكون خالقة للطلب إلى أن يتوازن مع العرض ويتعافي الاقتصاد من الكساد،

فهنا أصبحت مهام الدولة تدخلية ولم تعد حارسة فقط, اذ كان لابد من احداث تحولات في الفكر الكلاسيكي من خلال النظرية الكينزية (نسبة الى جون ماينرد كينز) صاحب كتاب (النظرية العامة للتوظيف والفائدة والنقود) الذي طالب الحكومة أن تتدخل بقوة في جانب الطلب من خلال الانفاق العام الحكومي لسد النقص في الطلب الكلي, اذ ان تقاطع منحنى العرض الكلي مع منحنى الطلب الكلي عند مستوى اسعار منخفض ومستوى تشغيل دون الاستخدام الشامل (انكماش) فان علاجه من خلال زيادة الطلب الكلي الذي بين انه سوف تخفض البطالة وتزيد الانتاج كما انها في ذات الوقت سوف ترفع مستوى الاسعار في مرحلة الانتعاش المرتقبة.

ومنذ ذلك الحين صار التحكم بالانفاق الكلي من خلال التدخل الحكومي وتحريك الانفاق العام واحدا من اهم ادوات السياسة الاقتصادية المؤثرة في الاهداف المرغوبة سواء كانت تلك الاهداف مزيدا من معدلات التنمية مع مستوى مقبول من اللااستقرار النقدي او كانت سياسات استقرارية نقدية في ظل معدلات نمو مقبولة. واصبحت الدورات الاقتصادية اقل حدة وأطول مدة حيث اصبح المنحنى المعبر عن هذه الدولارات اكثر انبساطا في مراحل (الانتعاش – التباطؤ – الركود – الكساد) وصارت الازمات لاتصل الى حد (الكساد الاعظم) وانما (تباطؤ في النمو وربما ركود لفترة اقصر من ذي قبل) ناجم عن تراجع الطلب وارتفاع معدلات البطالة لحين عمل إجراءات إدارة الطلب والتدخل الحكومي لخلق طلب حكومي يعوض النقص الحاصل في الطلب الخاص، في ظل عالم من التكيفات للسياسات الاقتصادية الحكومية والتوقعات العقلانية لم تعد التأثيرات الناجمة عن الأزمة والإجراءات الحكومية المضادة لها مستفزة على شكل (صدمة) فبالقدر الذي تساهم فيه العولمة والاتصالات والمعلوماتية في سرعة نقل آثار الأزمة تساهم هذه الأدوات ذاتها في سرعة نقل العلاجات والإجراءات بل وحتى التحسبات الوقائية.

عليه لم تكن الدورات الاقتصادية ذات نهايات شديدة الانحدار كما كانت في أزمة الكساد الكبير في 1929 قبل النظرية الكنزية وما تبعها من تحولات في النظرية الرأسمالية ذاتها، بل أصبحت نهاياتها العليا (فترات الانتعاش) ونهاياتها الدنيا (فترات الكساد) اقل شدة وتأثيرا في الحياة الاقتصادية، وهو سر استمرار الفكر الرأسمالي الليبرالي رغم مواجهته للأزمات الكبيرة فهو يمتلك من المرونة والقدرة على التحول والأخذ بأدوات مدارس فكرية أخرى , وصارت السياسات الاقتصادية الكلية المؤثرة في جانبي العرض والطلب تعطي

المضادات والمهدئات المانعة لحصول الأزمة و/ أو المخففة لأثرها، واتسعت أدوات هذه السياسات مع توسع نطاق التأثيرات في ظل العولمة والانفتاح الاقتصادي العالمي بين مختلف دول العالم.

مشكلة البحث

يمكن وصف مشكلة البحث في السؤال الآتي وهو , هل يمتلك الفكر الاقتصادي الرأسمالي المرونة التامة في التحول وفق المتغيرات الدولية دون التخلي عن منهجه ومبادئه الاساسية.

فرضية البحث

يفترض البحث ان النظام الفكري الرأسمالي يمتلك المرونة التامة في التحول والملائمة مع الظروف الاقتصادية المختلفة دون ان ينهار, فهو نظام حقق سبل واسباب بقاءه من خلال المرونة التي يتمتع بها.

أهمية البحث

تأتي أهمية البحث من خلال دراسته لموضوع التحول الاقتصادي الذي اتخذته المدرسة الرأسمالية للحفاظ عليها من الانهيار فقد اتخذتمن المدرسة الكينزية البديل المناسب لاستدامتها والبقاء على افكارها ونظامها دون الاضطرار الى الانهيار ودخول مدارس فكرية اخرى .

هدف البحث

يهدف البحث الى بيان أهمية المرونة في الفكر الاقتصادي الكلاسيكي واتخاذها مبدأ مهم يعتمد عليها من اجل البقاء ومواجه التغيرات العالمية والانفتاح الاقتصادي الكبير مع دول العالم, ومن أجل عدم انهيار مبادئ النظام الرأسمالي بشكل عام .

هيكلية البحث

لغرض الوصول الى هدف البحث ومعالجة المشكلة التي انطلق منها فقد تم تقسيم البحث على ثلاث محاور جاء المحور الأول منه بالاطار النظري للمدرسة الكلاسيكية والمدرسة الكينزية , ثم المحور الثاني الذي تطرق الى اهم الازمات التي تعرض لها النظام الرأسمالي الكلاسيكي وكيف تم التحول على وفق المنهج الكينزي, في حين جاء المحور الثالث بأهم الاستنتاجات والتوصيات التي توصل لها البحث ليختتم البحث بها.

المحور الأول

الإطار النظري للمدرسة الكلاسيكية والمدرسة الكينزية

أولاً : الإطار النظري والفكري للمدرسة الكلاسيكية

تستند الفلسفة الاقتصادية التي جاء بها كتاب الرأسمالية التقليدية على فرضية أساسية هي أن ظاهرة الثروة في المجتمع ترجع إلى أصل واحد هو رغبة الفرد في تحسين حالته الاقتصادية . أي بعبارة أخرى أن حافز المصلحة الشخصية (الربح المادي) هو المحرك الأساسي للنشاط الاقتصادي, وقد استخلص ادم سمث من هذه الفرضية مبدأ تلقائية النظام الاقتصادي الرأسمالي ، الذي يستند عل المنافسة التي تضمن تحقيق الكفاية في تخصيص الموارد الاقتصادية وتحقيق التوازن بين العرض والطلب بوساطة قوى (آلية السوق) سماها سمث باليد الخفية التي من شروطها افتراض المرونة التامة في الأسعار والاجور[1], ولا يقتصر دور المنافسة التامة في السوق على تحقيق الكفاية في الانتاج ، وإنما يضمن أيضا توفير السلع بسبب عدم إمكانية أي والخدمات الى المستهلكين بأقل الاسعار الممكنة، وذلك منتج في التاثير في عرض السلعة أو في سعرها، بحكم فرضية حرية الدخول الى السوق من قبل المؤسسات الجديدة ومنافسة المؤسسات القائمة, واستناداً الى الفلسفة الاقتصادية التقليدية، يتم تحقيق التوازن بين العرض الكلي والطلب الكلي عند مستوى الاستخدام الكامل للموارد الاقتصادية، أي عدم وجود ما يسمى بالبطالة القسرية أو غير الارادية في الاقتصاد, أي بعبارة أخرى، أن أية بطالة يمكن أن تحدث لا بد أن تكون بطالة ارادية أو طوعية ، والتي تعزي الى رفض العمال الاشتغال بالاجور السائدة في السوق, كذلك تعتبر فرضية عدم امكانية حدوث فائض في الانتاج هي النقطة الجوهرية في الفلسفة الاقتصاد التقليدية . وتستند هذه الفرضية عل مبدأ أن العرض, يخلق الطالب, ويعرف هذا المبدأ في الفكر الاقتصادي « بقانون الاسواق » الذي جاء به الاقتصادي الفرنسي جان بابتس ساي (1767– 1833) والذي يعتبر بمثابة حجر الزاوية في الفكر الاقتصادي الذي كان سائدا في القرن التاسع عشر وحتى أوائل القرن العشرين, وقد أدى انتشار أفكار ساي الى ظهور مدرسة في الفكر الاقتصادي تعرف بالمدرسة المتفائلة الحرة التي سيطرت عل الفكر الاقتصادي في فرنسا في القرن التاسع عشر[2], ومن أبرز الازاء التي جاء بها ساي أنه اعتبر الاقتصاد علما طبيعيا ، وافترض ان الثروة تخلق وتوزع وتستهلك طبق قوانين الطبيعة ودون الحاجة الى أي تدخل حتى أنه ذهب أبعد من اراء سمث في من جانب الدولة في الحياة الاقتصادية . هذه الناحية واعتبر تدخل الدولة في الحياة الاقتصادية غير مرغوب

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[1] – جورج سول, المذاهب الإقتصادية الكبرى , ترجمة , راشد البراوي, ط1, مكتبة النهضة المصرية, بالاشتراك مع مطبعة فراكلين, القاهرة , نيويورك, 1953, ص 66.

[2] - Peter De Keyzer, Growth Makes You Happy: An Optimist's View of Progress and the Free Market, Antique Collectors Club Limited, first edition, 2014, p 125.

فيه حتى في الحالات التي يكون فيها هذا التدخل امرا لا بد منه . واعتبر ساي ان هناك قوى معينة في النظام الاقتصادي تعمل عل تحقيق التوازن بصورة تلقائية . والجدير بالملاحظة أن ساي لم ينف احتال حدوث فائض في الانتاج في سلعة معينة في الأجل القصير (والذي يعزى الى تدخل الدولة في الحياة الاقتصادية) وإنما رفض قبول فكرة حدوث فائض في الانتاج بصورة عامة ، وذلك لان الطلب الكلي ما هو الا عبارة عن مجموع السلع المنتجة في الإقتصاد , لذلك فأن هدفنا هنا هو إظهار خصائص النموذج النظري للرأسمالية الذي تم تبنيه من قبل علماء الاقتصاد الاوائل وفي مقدمتهم ادم سمث (1723 – 1790) وعلى رغم أن هذا النموذج استند عل المرحلة التاريخية التي عاصرها أولئك الكتاب في أعقاب الثورة الصناعية في بريطانيا[3]، إلا أنه يمثل حالة مثالية مجردة ولا يعكس بالضرورة صورة عصر اقتصادي ذهبي تغير في مرور الزمن. ويمكن لنا تعريف الرأسمالية كنظام اقتصادي بأنها عبارة عن تنظم اقتصادي بالملكية الخاصة لوسائل الانتاج (العمل ، الارض ، ورأس المال) ، ويحق للافراد استخدام هذه الوسائل بالطريقة التي تحقق هم أقصى المنافع الممكنة . ولا يخضع هذا النظام الى التخطيط أو السيطرة من قبل الحكومة . ويقتصر التدخل الحكومي في الحياة الاقتصادية ، حسب رأي قادة الفكر الرأسمالي في ثلاثة مجالات هي :

1. توفير حد أدنى من الخدمات الاجتماعية الضرورية ، كالتعلم والصحة وخدمات البريد والمواصلات .
2. الدفاع عن الحدود السياسية للبلد.
3. توفير الامن الداخلي وسيادة القانون لحماية حقوق الملكية والعلاقات التعاقدية بين الأفراد والمؤسسات .

ثانياً : الإطار النظري والفكري للمدرسة الكينزية

يعد ظهور الفكر الكينزي بموجب توصيفات بعض المفكرين بأنه (ثورة)، أطاحت بما هو متوارث من الفكر الرأسمالي، بيد أن هذا الظهور لم يكن حالة عابرة أو ارهصات مفكر، بل أن الشعور بالرضا والإرتياح عن أداء الاقتصادات الرأسمالية الرئيسة لم يعد كذلك ، وبخاصة بريطانيا حاملة الثورة الصناعية ومولد الفكر الاقتصادي ، على خلفية الحرب العالمية الأولى 1914— 1918، التي مزقت أوصال التجارة والمدفوعات الدولية, لقد شكلت أفكار جون مينارد كينز، قوة كبيرة في النظرية الاقتصادية والتطبيق الاقتصادي، وأحدثت تطورا عظيما في الاقتصاد المعاصر، وتكتسب أعظم دلالاتها هو كونها تمثل تحولا في المنهجية الاقتصادية بوجه عام . قيل عنه إشتراكيا مرة وأخرى رأسماليا مرتدا عنها، تعرض للنقد، وأهملت أطروحاته وآراءه ردحا

[3] - Steven G Medema, Warren J. Samuels, The History of Economic Thought: A Reader, Routledge, Second Edition, 2013, p514.

من الزمن، ثم ذاع صيته في المحافل الرسمية والفكرية، في الجامعات ومنتديات الفكر، فهو لم يكن اقتصاديا فحسب، بل مؤرخا ومعرفيا وفنانا، مهتما بعلم الجمال أحيانا، حتى أنه قارب شعبية (تشرشل) رئيس وزراء بريطانيا آنذاك[4].

جاءت الحرب، العالمية الثانية لتعطي لأفكار كينز مساحتها المنتظرة من النجاح، ولتوجه ضربة قوية للرفض الكلاسيكي لتدخل الدولة في الحياة الاقتصادية، ومثلما أكدت الحرب صحة ومصداقية الفكر الكينزي، وجهت في الوقت نفسه ضربة للسياسات الرأسمالية القائمة على المبدأ الكلاسيكي (دعه يعمل . . دعه يمر). لكنه في النهاية قدم للرأسمالية في عمق أزمتها ولحظة احتضارها، وفي ظرف تاريخي حاسم، قدم علاجا ناجعا، قال عنه شومبيتر (انه طبيب إسعاف الرأسمالية)، تبرا من الكثير من المقدسات الرأسمالية، وأستخدم محرماتها أحيانا، لكنه ظل أمينا على فكره البرجوازي، ومعتداً بأسس الرأسمالية كنظام اقتصادي, بل عد المنقذ للنظام الرأسمالي من الإنهيار.

المحور الثاني

أهم الأزمات التي تعرض لها النظام الرأسمالي الكلاسيكي وآلية التحول الى الكينزية

أولاً : واقع الأزمات في النظام الكلاسيكي

لقد ناقش المؤرخون الاقتصاديون طويلا سبب الكساد العظيم، ولكن لم يتوصلوا الى إجابة مقنعة ، والسؤال الأهم هو ما الذي حول الركود المؤقت الى كابوس؟، إذ عايشت أمريكا فترات ركود من قبل ولكن ليس بهذه الحدة. اما كينز فقد كان مجبرا على(صراع طويل للهروب) من التراث الذي ترعرع في ظلاله، لقد كانت رؤيته واضحة بان الاعتراف بان المستقبل مجهول ومن شانه أن يؤدي الى تهديم مجموع البنيان النظري الأرثوذكسي المستند الى مفهوم التوازن اللازمني (Equilibrium Timeless). يؤكد أغلب الاقتصاديين في تفسير الأزمة إجتماع (تصادف) أكثر من حدث سيء في وقت واحد، من مثل نضوب فرص الاستثمار بعد تسارعها في العشرينات، قرار المستهلكين تقليل الإنفاق وسداد القروض، إتخاذ الحكومات المذعورة لسياسة حمائية، وفي مواجهة كل ذلك كان رد فعل نظام الاحتياطي الفيدرالي هو سياسات اشد، وليس سياسات اخف. منذ قرن مضى من نظرية كينز ناقش مالثوس مع ريكاردو موضوعة أمكانية حدوث إفراط في الإنتاج[5]، على انه المقابل لنقص في الطلب المتأتى من نقص الاستهلاك، إلا أن الجميع رفضوا آنذاك ما سمي أكذوبة وقصور الإستهلاك أو نقص الطلب، وإذا كان نقص الطلب الفعال(Demand

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[4] – عبد علي كاظم المعموري , تأريخ الأفكار الإقتصادية , ط1, ج2, مركز حمورابي للبحوث والدراسات الإستراتيجية, بغداد , 2007, ص 127.

[5] - Alfred William Coats, On the History of Economic Thought, Routledge, first edition, 1992, p 129.

Effective) لا يمكن أن يحدث تبعا لأراء ريكاردو وساي، فمن الواضح انه لا يمكن أن تكون. هناك حاجة الى إجراء حكومي لتعزيز الطلب, على هذه الخلفية شن كينز هجومه على ساي وقانونه آذ يقول (الشيء الأكثر غباء هو تصديق قانون ساي الذي هاجمه مالثس منذ قرن مضى)، والية التوازن المفترضة، مدعيا أن الاقتصاد الرأسمالي مقبل على عدم التوازن والاضطراب، لعدم قدرة آليات السوق من ضبط التدفقات الاقتصادية، مفترضا أن الإقتصاد لا يجد بالضرورة توازن في العمالة الكاملة (التامة) بل يستطيع الاقتصاد من الوصول الى التوازن حتى عند المستوى الاقل من مستوى التشغيل التام اي بمعنى آخر , حتى ان كانت هناك بطالة في الاقتصاد.

ومثلما أثبت كينز عدم أمكانية تحقيق الاستخدام الكامل وفقا لرؤية ساي، ذهب الى التشكيك بالتوازن بين الادخار والاستثمار، وهو ما كان مفترضا بحسب الفروض الكلاسيكية، استنادا لحيادية النقود، فيقول كينز أن حجم الاستثمار يكون بالضرورة مساويا لحجم الادخار، ولكن عند التأمل يتبين أن الحال ليست كذلك.

تبعا لذلك يصبح من الصعب الاعتماد على أراء الكلاسيك، من أن كل الدخل ستحقق عائدا في صورة طلب على السلع ولخدمات، وفقا لما نص عليه "قانون ساي اذ ان بعضه يمكن ان يتسرب عن طريق مدخرات غير مستخدمة في الاقتصاد[6].

لقد بدت الصورة في ظل تلك الأوضاع ان الحاجة كانت ماسة الى مثل كينز ليهدئ من روع الاقتصاديين ومعهم أجيال قلائل أساءوا تعليمها، اذ كانت بريطانيا تشعر بالارتباك والحيرة من تحقيق توازن بين الصرح المنطقي البراق الذي أقامته الكلاسيكية ، وبين صورة الواقع الرهيب التي تتراءى أمام أنظارها.[7]

لقد تعرض الاقتصاد العالمي للعديد من الأزمات، من أهمها أزمة انهيار نظام "بريتون وودز"، وأزمة الكساد الكبير Depression Great في الثلاثينيات، والأزمة الآسيوية في التسعينيات، وأخيرا أزمة الاقتصاد العالمي الحالية، والتي دعمتها الأحداث التي تعرضت لها الولايات المتحدة الأمريكية مؤخرا[8]، ترتب على أزمة الكساد الأعظم (يوم الخميس الاسود) 24 اكتوبر سنة 1929 انهيار البورصة الأمريكية، ومن مظاهر هذا الانهيار تراجع مؤشر داوجونز 50% في يوم واحد، ثم لحقته تداعيات وصلت الى 30 مليون عاطل، وحصل الهلع الشديد فمثلا يذكر أن امرأة أمريكية وقفت في الصف مع أمها أمام بنك في شيكاغو لسحب مدخراتها البالغة 50 دولار، وخرجت من البنك بدولارين فقط.

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[6] - Antoin Murphy, Renee Prendergast, Contributions to the History of Economic Thought, first edition, Routledge, 2000, p 209.

[7] – عبد علي كاظم المعموري , مصدر سبق ذكره , ص 131.

[8] - E. K. Hunt, Mark Lautzenheiser,History of Economic Thought: A Critical Perspective, M.E. Sharpe, second edition, 2011, p 313.

حصل الكساد العظيم عندما كانت النظرية الاقتصادية الكلاسيكية هي الحاكمة، حيث ان هنالك قوى آلية (اليد الخفية) في السوق هي التي تعيد التوازن بين العرض والطلب وتمتص أوتوماتيكيا الضغوط التضخمية او الأنكماشية التي تحصل في الامد القصير، فكانت آلية السوق هذه من المسلمات المختبرة لفترة ليست قصيرة وتعمل بكفاءة، وبقي العالم ينتظر في ثلاثينيات القرن المنصرم ان تعمل اليد الخفية دون جدوى، حيث كان يعد التدخل الحكومي في جانبي العرض او الطلب إرباكا واعاقة لعمل آلية السوق وعلى الحكومة ان تبقى بعيدة، فصار الكساد الاعظم وتوقفت عجلة الانتاج بشكل شبه تام لعدم وجود (طلب) على المنتجات[9]، وصارت المعامل تسرح العاملين فيها واصبحت البطالة بمعدلات كبيرة جدا والدخول الموزعة لعناصر الانتاج متدنية الى الحد الذي لايخلق طلبا يذكر على العرض السلعي، وحصل الكساد الاعظم الذي قلب قواعد الفكر الاقتصادي الراسمالي وطورها كثيرا، كما يتضح لاحقا.

ثانياً : آلية التحول من النظام الكلاسيكي الى الكينزي في معالجة الأزمات الإقتصادية

تعرضت الفلسفة الاقتصادية التقليدية الى انتقادات حادة خلال القرن التاسع عشر. وتعتبر نظرية كارل ماركس التي جاء بها حول حتمية انهيار الرأسمالية وحلول الاشتراكية محلها من أبرز التحديات التي وجهت الى هذه الفلسفة, الا أن التحدي الحقيقي الذي تعرضت له المدرسة الكلاسيكية جاء بعد حدوث الازمة الاقتصادية الحادة التي تعرضت لها بريطانيا والولايات المتحدة عام 1929 الى 1932, وكذلك بعد نشر كتاب النظرية العامة لكينز في عام 1936, إذ أدرك كينز أن واقع النظام الرأسمالي يتسم بالتقلبات الاقتصادية وعدم الاستقرار الاقتصادي . ومع أن ماركس أكد أن الازمات الاقتصادية هي ملازمة للنظام الرأسمالي ولا يمكن التخلص منها الا بزوال النظام نفسه[10]، الا أن كينز حاول أن يقدم برنامجا عمليا لانقاذ الرأسمالية من الانهيار (أي اصلاحها من الداخل بدلا من استبدالها بنظام اخر) وذلك من خلال التدخل الحكومي في الحياة الاقتصادية واستخدام وسائل معينة (السياسات المالية والنقدية) لتوجيه الاقتصادات الرأسمالية وتكييفها لمواجهة الازمات الحادة, ويعزى السبب الرئيسي لحدوث الأزمة الاقتصادية بالنسبة لكينز الى النقص في الطلب الفعال، وبسبب عجز الاستثمار الخاص عن امتصاص الادخارات المتزايدة لدى الافراد, مما يتطلب تدخل الحكومة في حل هذه الاشكالية واعادة توظيف المدخرات.

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[9] – بول كروغمان, لنضع حداً للكساد الإقتصادي الآن , ترجمة, منذر كاظم حسين , ط1, دار ترجمان , بغداد, 2016 . ص 33.

[10] - Alessandro Roncaglia, A Brief History of Economic Thought, Cambridge University Press, first edition, 2017, p 219.

فلم تعد الدولة بعد هذه الأحداث حارسة فقط, اذ كان لابد من انقلاب على الفكر الكلاسيكي من خلال النظرية الكينزية الذي طالب الحكومة أن تتدخل بقوة في جانب الطلب من خلال الانفاق العام الحكومي لسد النقص الحاصل في الانفاق الخاص وخلق دخول موزعة من خلال تشغيل العاطلين ولو بأعمال ثانوية غير منتجة بما يؤدي الى دفع الطلب الكلي الى الاعلى ومايتبعه من خلق طلب على منتجات المعامل المعطلة لتعيد فتح أبوابها واستيعاب العمال المسرحين من جديد واعطاء هم دخول تذهب للأنفاق وتكون خالقة للطلب إلى أن يتوازن مع العرض ويتعافي الاقتصاد من الكساد[11]، اذ ان تقاطع منحنى العرض الكلي مع منحنى الطلب الكلي عند مستوى اسعار منخفض ومستوى تشغيل دون الاستخدام الشامل (انكماش).

فان بزيادة الطلب الكلي سوف تخفض البطالة وتزيد الانتاج وفي ذات الوقت سوف ترفع مستوى الاسعار في مرحلة الانتعاش المرتقبة. ومنذ ذلك الحين صار التحكم بالانفاق الكلي من خلال التدخل الحكومي وتحريك الانفاق العام واحدا من اهم ادوات السياسة الاقتصادية المؤثرة في الاهداف المرغوبة سواء كانت تلك الاهداف مزيدا من معدلات التنمية مع مستوى مقبول من اللااستقرار النقدي او كانت سياسات استقرارية نقدية في ظل معدلات نمو مقبولة. واصبحت الدورات الاقتصادية اقل حدة وأطول مدة حيث اصبح المنحنى المعبر عن هذه الدولارات اكثر انبساطا في مراحل (الانتعاش – التباطؤ – الركود – الكساد) وصارت الازمات لاتصل الى حد (الكساد الاعظم) وانما (تباطؤ في النمو وربما ركود لفترة اقصر من ذي قبل) ناجم عن تراجع الطلب وارتفاع معدلات البطالة لحين عمل إجراءات إدارة الطلب والتدخل الحكومي لخلق طلب حكومي يعوض النقص الحاصل في الطلب الخاص، في ظل عالم من التكيفات للسياسات الاقتصادية الحكومية والتوقعات العقلانية لم تعد التأثيرات الناجمة عن الأزمة والإجراءات الحكومية المضادة لها مستفزة على شكل (صدمة) فبالقدر الذي تساهم فيه العولمة والاتصالات والمعلوماتية في سرعة نقل آثار الأزمة تساهم هذه الأدوات ذاتها في سرعة نقل العلاجات والإجراءات بل وحتى التحسبات الوقائية، عليه لم تكن الدورات الاقتصادية ذات نهايات شديدة الانحدار كما كانت في أزمة الكساد الكبير في 1929 قبل النظرية الكنزية وما تبعها من تحولات في النظرية الرأسمالية ذاتها، بل أصبحت نهاياتها العليا (فترات الانتعاش) ونهاياتها الدنيا (فترات الكساد) اقل شدة وتأثيرا في الحياة الاقتصادية[12]، كما مبين في الشكل (1)، وهو سر استمرار الفكر الرأسمالي الليبرالي رغم مواجهته للأزمات كبيرة فهو يمتلك من المرونة والقدرة على التحول والأخذ بأدوات مدارس فكرية أخرى قد تكون اشتراكية او إسلامية، وصارت السياسات الاقتصادية الكلية المؤثرة في جانبي العرض والطلب تعطي المضادات والمهدئات المانعة لحصول الأزمة و/ أو المخففة

[11] – أسماعيل سفر, عارف دليلة , تاريخ الأفكار الإقتصادية , ط11, مطابع جامعة دمشق , سوريا, 2001, ص 581.

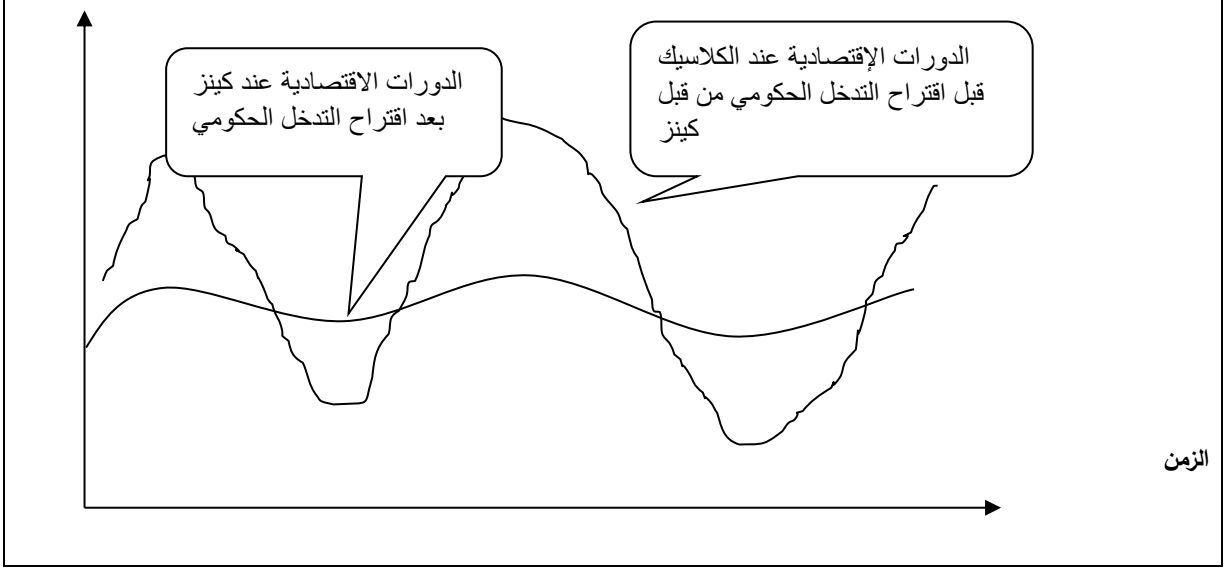
[12] - Henry William Spiegel, The Growth of Economic Thought, first edition, Duke University Press, 1991, p, 395.

لأثرها، واتسعت أدوات هذه السياسات مع التوسع في نطاق تأثير العوامل المؤثرة الأخرى ومنها العولمة واتساع نطاق الخطر في ظلها لتشمل العالم بأسره وليس دول محدد بذاتها[13].

المصدر / من اعداد الباحثة استناداً الى التحليل اعلاه .

شكل (1)

الدورات الإقتصادية عند الكلاسيك وعند كينز



وجد الكلاسيك من خلال النموذج والمعالجة الكينزية للأزمات التي كانت ترافقهم حلاً جذرياً لها واكتسبت بذلك هذه المدرسة دافعاً قوياً للاستمرار في هذا النهج الاقتصادية ما دام هناك متسع من المرونة التي تم اكتشافهاعن طريق كينز ونجح تطبيقها في دول الأنظمة الرأسمالية سواء كانت بريطانيا او الولايات المتحدة الامريكية وغيرها[14]. فكان تحولاً ناجحاً ومرناً يحافظ على النظام العام للمبادئ الرأسمالية.

المحور الثالث

الإستنتاجات والتوصيات

أولاً : الاستنتاجات

1. يقوم النظام الرأسمالي على مبدأ الحرية الاقتصادية، وينحسر دور الدولة في كونها حارسة ومشرعة ومنظمة ومقدمة للخدمات العامة الرئيسة التي لا يلج اليها القطاع الخاص.

[13] – رضا عبد السلام, تقديم أحمد جمال الدين موسى و علي لطفي, أنهيار العولمة , ط1, دار الكتب العربية, القاهرة , 2002, ص 47.

[14] - Antoin Murphy, Renee Prendergast, Contributions to the History of Economic Thought, first edition, Routledge, 2000, p 209.

2. بعد حدوث خلل في التوازن وظهور النقص الحاصل في الانفاق الخاص وضرورة خلق دخول موزعة للافراد, من خلال تشغيل العاطلين ولو بأعمال ثانوية غير منتجة بما يؤدي الى تحقيق دخل للافراد من أجل تفعيل الطلب الكلي في الاقتصاد.
3. أصبحت مهام الدولة تدخلية ولم تعد حارسة فقط, كان لابد من احداث تحولات في الفكر الكلاسيكي من خلال النظرية الكينزية.
4. كانت الدورات الاقتصادية ذات نهايات شديدة الانحدار كما كانت في أزمة الكساد الكبير في 1929, وما تبعها من تحولات في النظرية الرأسمالية ذاتها، اماعند اعتماد النظرية الكنزية لحل الأزمة فقد أصبحت نهاياتها العليا (فترات الانتعاش) ونهاياتها الدنيا (فترات الكساد) اقل شدة وتأثيرا في الحياة الاقتصادية.
5. ان النظام الرأسمالي نظام مرن قادر على الإستمرار رغم حدوث الأزمات فيه في كل مرة على مدى السنوات.

ثانياً: التوصيات

1. من الضروري اتباع المرونة في أي منهج اقتصادي من أجل ضمان الوصول الى الاهداف وتحقيقها بشكل جيد.
2. من المهم اتباع السياسات التطبيقية الملائمة وفق المنهج الاقتصادي المتبع لدولة مع الحفاظ على المبادئ العامة التي تأسس بموجبها ذلك النظام والنهج الاقتصادي.
3. من المهم ان يكون التحول في الافكار الاقتصادية مدروساً وفق النظريات الاقتصادية السابقة وما واجهن من تحديات في التطبيق العملي على النظام الاقتصادي في الدولة.

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Abstract

Keynes is considered the savior of the capitalist system and recommended the adoption of the principle of flexibility in allowing the state to intervene in the treatment of the crisis of 1929 after its aggravation in society, due to its great ability and potential with its capital and general power over individuals. And in fact, this was done, and the capitalist system reached the optimal solution in dealing with the crisis of the Great Depression thanks to the ideas of the economist Keynes. The classicism and the Keynesian school, then the second axis, which touched upon the most important crises faced by the classical capitalist system and the mechanism of transformation according to the Keynesian approach, while the third axis came with the most important conclusions and recommendations. Shifts in classical thought through Keynesian theory. Economic cycles had steep ends, as they were in the Great Depression in 1929, and the subsequent transformations in the capitalist theory itself. When the Keynesian theory was adopted to solve the crisis, its higher ends (periods of recovery) and lower ends (depression periods) became less severe and influential in life. Economic. As for the recommendations, it is necessary to follow flexibility in any economic approach in order to ensure that the goals are reached and achieved well.

Keywords: transformations of the capitalist system, Keynesianism, continuity factors.

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"قياس الكفاءة التقنية باستخدام التحليل الحدودي العشوائي SFA لمزارع الشعير في محافظة واسط / العراق"

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المستخلص

يعد ضعف الإدارة في اداء واجباتها احد اهم المشاكل التي يعاني منها القطاع الزراعي العراقي، مما يفضي الى عدم تحقيق الإستخدام الامثل لعناصر الانتاج الذي لايتحقق معه المستويات العليا من الانتاج الزراعي، لذلك هدف البحث الى قياس الكفاءة التقنية TE بإستخدام التحليل الحدودي العشوائي SFA وبإستخدام الدالة اللوغاريتمية المتسامية (المتفوقة) TL لعينة عشوائية مكونة من 44 مزارعاً لمحصول الشعير في محافظة واسط / قضاء الصويرة للموسم 2019 – 2020 ، وتضمن الأنموذج اعتماد كمية الانتاج كمتغير تابع فضلاً عن التركيز على المتغيرات المستقلة التي تمثل المدخلات الاساسية المستخدمة في جميع مزارع العينة والتي اشتملت (المساحة، كمية سماد اليوريا، كمية السماد المركب، كمية البذور، ساعات العمل الآلي، ساعات العمل اليدوي)، فضلاً عن المتغيرات التي تتعلق بالإدارة المزرعية (عمر المزارع، سنوات الخبرة)، أشارت النتائج الى إن طريقة المربعات الصغرى أعطت تقديراً متواضعاً للجزء المنقطع B_0 إذ بلغت قيمتة 3.87– في حين بلغت القيم المقدرة وفق طريقة المربعات الصغرى المصححة COLS وطريقة الإمكان الأعظم ML إذ بلغت 3.47– و 80.06 على التوالي، أما اشارة المتغيرات المدروسة فجاءت متطابقة مع المنطق الاقتصادي ماعدا متغيرات المساحة والسماد المركب وساعات العمل اليدوي والخبرة جاءت سالبة ومؤكدة التأثير السلبي لهذه المتغيرات على المتغير المعتمد، بلغ متوسط الكفاءة التقنية على مستوى العينة 58% وهذه النتيجة تشير إلى انه هناك إنحرافاً في الإنتاج الفعلي عن الإنتاج الأمثل بنسبة 42% وبإمكان المزارعين تحقيقه لو استُخدمت الموارد الإقتصادية المتاحة استخداماً أمثلاً، كما بلغت الدالة اللوغاريتمية لأقصى إحتمال قيمة سالبة 27.21– وهذا يدل إن هناك تغيرات تقنية تؤثر سلباً في المتغير العشوائي ومن ثم في الكفاءة التقنية، وعليه يوصي البحث بضرورة اتباع الأساليب العلمية الحديثة في إدارة مزارع الشعير وإعادة توزيع الموارد الإقتصادية بما يضمن تحقيق المستوى نفسه من الإنتاج او أكثر في ظل خفض التكاليف فضلاً عن تطوير إستخدام الوسائل والتقنيات الحديثة في مزارع الشعير.

الكلمات المفتاحية : التحليل الحدودي العشوائي ، الكفاءة التقنية. دالة الانتاج اللوغارتيمية المتسامية

المقدمة

يعد محصول الشعير من المحاصيل الحبوبية المهمة في العالم وهو يتفوق على القمح والشوفان في الأنتاجية في ظل الظروف المجهده للنبات مثل الجفاف، الصقيع ، وتغطي زراعته مدى بيئياً واسعاً ، ويأتي الشعير بالمرتبة الثانية في العراق بعد القمح في الأهمية والمساحة أذ يزرع مايزيد على المليون هكتار سنوياً في المناطق الوسطى والجنوبية بسبب مقاومته للأملاح ويزرع على نطاق أوسع في المناطق الديميه والمحدوده الأمطار (200–300) ملم سنوياً، وبمساحات تصل الى الخمسة ملايين دونم ، ويتمتع بأهمية اقتصادية تنبع من تعدد استخداماته وهو محصول مهم عالميا ومحليا يحتوي على الكاربوهيدرات والبروتينات والعناصر المعدنية والفيتامينات المهمة غذائياً (14).يمتاز بتعدد استعمالاته الغذائية والعلفية والطبية فضلا عن دخولة في الصناعة ،وان استعمالة كمادة علفية للحيوانات التي تعتبر المكون الرئيس الثاني للقطاع الزراعي فانه يعد محصولا مهما وذلك لدوره الفعال في تحقيق الامن الغذائي .

مشكلة البحث : ان أنخفاض انتاج المحصول الشعير وعدم امكانية تحقيق مستويات عالية من الانتاج جاء انطلاقا من تدني استخدام الموارد الاقتصادية المتوفرة,وصعوبة الحصول على الموارد الاقتصادية الاخرى مما ادى الى انخفاض مستوى الدخل الزراعي، مما نحى بمستوى الكفاءة الاقتصادية بعيدا عن المستوى المطلوب.

هدف البحث : يهدف البحث الى معرفة العلاقة بين مدخلات انتاج الشعير والناتج منه من خلال تقدير دالة الانتاج العشوائية لمحصول الشعير في قضاء الصويرة . والتعرف على مدى انحراف الانتاج الفعلي عن الامثل من خلال قياس الكفاءة التقنية لانتاج الشعير في قضاء الصويرة.

المواد وطرائق البحث: تم الحصول على البيانات الأولية من مصادرها الميدانية اذ تم توزيع 44 استماره استبانه على عينة عشوائية مثلث اكثر من 90% من مجموع مزارعي الشعير في قضاء الصويرة, اذ تم جمع البيانات بالمقابله الشخصية مع مزارعي محصول الشعير للموسم (2019–2020)، في قضاء الصويرة، وتم استخدام برنامج Frontier لتقديرمعلمات دالة الانتاج العشوائية بثلاث طرق هي الامكان الاعظم ML)),المربعات الصغرى المصححة (COLS),المربعات الصغرى الاعتيادية (OLS).

يعد الاستغلال الامثل للموارد المتاحة هدفاً تسعى اليه مختلف النظم الادارية ولاسيما في القطاع الزراعي للعديد من الدول النامية ومنها العراق ،اذ انها تعاني من تدني الكفاءة الاقتصادية للمزرعة وعدم امكانية تحقيق النمو الاقتصادي المطلوب ،وتعتبر الكفاءة الاقتصادية احد المؤشرات التي يمكن بواسطتها التعرف على مدى كفاءة الادارة في توجية الموارد الاقتصادية المختلفة ،وتشير الكفاءة الاقتصادية الى الاثر المشترك

نتيجة لتحقيق كل من الكفاءة التقنية TE والكفاءة التخصيصية AE(1) ،توصي غالبية دراسات الكفاءة بالتركيز على الكفاءة التقنية في النشاطات الاقتصادية الزراعية (5)،تعرف الكفاءة التقنية بانها قدرة المزرعة على تحويل المدخلات الى مخرجات مادية ضمن حدود امكانيات الانتاج والتكنلوجيا المعطاة ،وتقع قيمتها بين الصفر والواحد الصحيح، فعندما تكون TE مساوية الى الواحد الصحيح ،يعني ذلك ان المزرعة تنتج على حدود امكانيات الانتاج وانها كفوءة تقنياً، وتشير الكفاءة التقنية الموجهة نحو المدخلات Input (Oriented) الى القدرة على تقليل استخدام المدخلات المادية لمستوى معين من الناتج (12) وبذلك يكون الهدف هو تقليل المدخلات ،لانه يمكن التحكم بالمدخلات وهي تمثل تكلفة الوحدات ويعد هذا الاختيار الافضل اذا ماتمت المقارنة بالكفاءة التقنية الموجهة نحو المخرجات

(Output Oriented)، التي لايمكن السيطرة عليها في القطاع االزراعي (3)، والكفاءة التقنية للمزرعة الفردية هي نسبة الانتاج الفعلي المقابلة لحدود الانتاج مع استخدام مستوى معين من المدخلات (9)، اذ تمثل الكفاءة التقنية مقياس نجاح المزرعة في انتاج الطاقة القصوى من مجموعة معينة من المدخلات . اماعندما تكون الكفاءة التقنية اقل من الواحد ذلك يعني بامكان المزرعة خفض نسبة المدخلات التي تحقق الانتاج السابق، او توفر نسبة من تكاليف الانتاج المستخدمة للحصول على نفس مستوى الانتاج السابق . مما سبق يتضح بانه يمكن النظر الى مؤشر الكفاءة الفنية من جانبين :الاول جانب المدخلات حيث تعرف الكفاءة بانها تحقيق مخرجات معينة بادنى مدخلات ممكنة ويعبر عنه بمقياس التخصيص في المدخلات ويتحقق هذا المعيار بمقارنة التوليفة الفعلية المثلى للمدخلات والمخرجات (ننظر من جانب المدخلات) بالمدخلات المطلوبة للمخرجات الفعلية الكفء ويمكن التعبير عنها بالعلاقة الاتية :

$$TE = \frac{\text{المدخلات المطلوبة االفعلية}}{\text{المدخلات الفعلية}}$$

وعليه فالوحدة الكفء هي التي تكون لديها المدخلات الفعلية تساوي المدخلات المطلوبة للمخرجات الفعلية الكفء أي تساوي 1 وتكون اكفأ تقنياً أما الوحدة غير الكفء فتكون لديها مدخلات فعلية اكبر من المدخلات المطلوبة للمخرجات وذلك يعني بإمكان الوحدة الإنتاجية خفض نسبة المدخلات التي تحقق نفس الإنتاج السابق ،او توفر نسبة من تكاليف الإنتاج المستخدمة للحصول على المستوى السابق للإنتاج. أما الجانب الثاني للكفاءة التقنية فهو جانب المخرجات الذي يمثل تعريف الكفاءة بإنها تحقيق أقصى المخرجات من

الموارد المتاحة ويعبر عنه بمقياس زيادة المخرجات(15) ، ويتحقق هذا المقياس بمقارنة التوليفة الفعلية للمدخلات والمخرجات (من جانب المخرجات) بالمخرجات الكفء للمدخلات نفسها، وبعبارة أخرى هي النسبة بين المخرجات الفعلية والمخرجات الممكن تحقيقها (الكامنة) عند مستوى الحد الكفء بإستخدام المدخلات الفعلية وتقاس بالعلاقة الآتية :

$$TE = \frac{\text{المخرجات الفعلية}}{\text{المخرجات الكامنة نفسها للمدخلات}}$$

وعليه فالوحدة الكفء تقنيا هي التي تحقق نسبة الواحد وتكون مخرجاتها الفعلية تساوي المخرجات الكامنة لمدخلاتها الفعلية أما الوحدة غير الكفء تقنيا فهي التي تحقق نسبة اقل من الواحد وتكون مخرجاتها الفعلية اقل من المخرجات الكامنة لمدخلاتها. ان الاسلوب المستخدم في هذا البحث هو التحليل الحدودي العشوائي SFA وهو اسلوب معلمي يضع في الاعتبار الخطأ العشوائي ويتطلب تحديدا مسبقا للأنموذج المستخدم ، وامكانية حدوث عدم الكفاءة عند التوصيف غير الدقيق للأنموذج، كما انه يتطلب الاقتصاد القياسي كطريقة للتقدير (6). ولهذا الاسلوب القدرة على تكوين أنموذج يشرح العلاقات ومحددات عدم الكفاءة في مرحلة واحدة ويستخدم لقياس مستوى الكفاءة الفنية والتخصيصية للمزرعة ومن ثم الكفاءة الاقتصادية (7) التي يتم تقديرها باستخدام هذا التحليل بطريقة دالة الانتاج ذات الحدود العشوائية The Stochastic Frontire Production Function التي اقترحت من الباحث Aigner وآخرون (1977) وتتسم بفصل البواقي Ei الى جزئين لهما تباين مشترك يساوي صفر ، الجزء الاول يمثل حالة عدم الكفاءة ويرمز له Ui اما الجزء الثاني فيمثل مصادر الاخطاء الاخرى ويرمز له Vi ويكون الخطأ العشوائي عبارة عن: (13).

$$Ei=Vi+Ui$$

اذ ان:

Ei: الخطأ الاصلي للأنموذج

Vi: خطأ القياس وسوء التوصيف

Ui: خطأ عدم الكفاءة

وقبل تقدير دالة الانتاج لابد من معرفة واقع انتاج محصول الشعير في العراق ومحافظة واسط . يوضح جدول 1. ان المساحة المزروعة بالعراق بلغت 4.5 مليون دونم وبإنتاج قدر 1.7 طن وتذبذبت انتاجيته من محافظة الى اخرى حسب الظروف الاقتصادية والبيئية اذ بلغت بالمتوسط 337.6 كغم / دونم وهي منخفضة مقارنة بإنتاجيات الدول المجاورة وهي تشير الى حجم عدم الاهتمام بهذا المحصول الحبوبي المهم . اسهمت محافظة نينوى بالمرتبة من حيث المساحة والانتاج , وجاءت واسط بالمرتبة الخامسة من حيث المساحة رغم محافظة واسط تمتلك مساحات كبيرة لانتاج الحبوب .جدول 1.

جدول 1. المساحة والانتاج والانتاجية لحصول الشعير في العراق حسب المحافظات للعام 2020.

المحافظة	المساحة/دونم	الانتاج/طن	الانتاجية كغم /دونم
نينوى	3,635,270	1,360,166	374.2
كركوك	6237	3101	497.2
ديالى	67224	29873	444.3
الانبار	17598	7245	411.7
بغداد	17197	8816	512.7
بابل	44616	14812	332
كربلا	5091	1951	383.2
واسط	75174	31494	419.1
صلاح الدين	15636	8198	611.5
النجف	8192	3528	430.7
القادسية	206548	105529	511
المثنى	146922	51054	347.5
ذي قار	141820	57786	407.4
ميسان	140000	72647	519
البصرة	962	0	0
المجموع	4,528,487	1,756,200	337.6

المصدر . وزارة التخطيط . الجهاز المركزي للاحصاء .

اما من حيث التكاليف الكلية فبلغت 182500 دينار للطن الواحد مقسمة الى كل من الكلفة المتغيرة التي بلغت حوالي 140500 دينار للطن مساهمة بما نسبته 77 % من التكاليف الكلية المتوسطة , اما متوسط التكاليف الثابتة فبلغ 42000 دينار للطن وهي تسهم بـ 23 % من متوسط الكلفة الكلية وهي نسبة منخفظة تشير الى ان انتاج الشعير يعتمد بشكل كبير على مكونات الكلفة المتغيرة .

جدول 2. متوسطات التكاليف الثابتة والمتغيرة والكلية .

الفئة	متوسط التكاليف المتغيرة دينار	متوسط التكاليف الثابتة دينار	متوسط التكاليف الكلية دينار
المجموع	**140500**	**42000**	**182500**

المصدر : استمارة الاستبانة .

تم استبيان المزارعين وسؤالهم عن اوجه تصرف المحصول، تبين ان 40 من المزارعين يسوقون انتاجهم للدولة رغم ان السعر مدعوم وهذا العزوف يعزى الى عدة اسباب منها صغر المساحات مما يولد انتاج بكميات قليلة ومراكز تسويقية بعيدة تكون غير مشجعة على التسويق الحكومي . فضلا عن ان 22 % منهم يستخدمون الانتاج الى الاعلاف سواء علف اخضر او حبوب بسبب ارتفاع اسعار الاعلاف وقلة الامطار وشحة المياه مما اثر على وجود المراعي وجعل نسبة لا باس بها يحولوم مساحاتهم المزروعة الى اعلاف خضراء فضلا عن تأخر استلام مستحقاتهم من الدولة وضعف الاجراءات الادارية والتعقيدات خفضت النسبة التسويقية من المحصول واثر ذلك في انخفاض الدخل المزرعي .

جدول 3. اوجه التصرف بمحصول الشعير .

الفقرة	النسبة من الإنتاج الكلي%
المستخدم كأعلاف	22
بذور	18

مسوق للدولة	40
مسوق للأسواق المحلية	20
المجموع	100

المصدر : استمارة الاستبانة .

توصيف الأنموذج المستخدم لتقدير الكفاءة التقنية لمزارع الشعير في عينة البحث للموسم الزراعي2019-2020 باستخدام اسلوب الحدود العشوائية (SFA) على وفق دالة الانتاج اللوغاريتمية المتفوقة :

يفترض في تقدير الكفاءة التقنية وقياسها لكل مزرعة معرفة دالة انتاج الحدود العشوائية ، وهي دالة مناسبة لدراسة الكفاءة الانتاجية للقطاعات التي تعاني من مشاكل وتباين كبير في البيانات كما هو الحال في القطاع الزراعي ، وتضم الدالة حدي خطأ وتأخذ الصيغة الآتية:

$$Lnyi = b_0 + LnXi + (Vi - ui) \quad .....(1)$$

إذ ان:

yi : اجمالي الكميات المنتجة من محصول الشعير (i) طن سنويا.

Vi : الخطأ العشوائي الموزع توزيعا طبيعيا وله متوسط حسابي مساوي للصفر وتباين ثابت ويشمل اخطاء القياس والظروف الخارجة عن السيطرة

ui : متغير عشوائي يمثل عدم الكفاءة التقنية. . وعلى اساس الأنموذج في المعادلة (1) فإن الكفاءة التقنية تحسب من قسمة الانتاج الفعلي على الانتاج المتوقع في كل منحل وعلى النحو الآتي :

$$TEi = yi / yi^* \quad .....(2)$$

TEi : الكفاءة التقنية للمزرعة i.

yi : الانتاج الفعلي للمزرعة i.

*yi : الانتاج الامثل للمزرعة ذات الكفاءة الاقتصادية بأستخدام المستوى نفسه من المدخلات.

ولتقدير معلمات الأنموذج وقياس الكفاءة التقنية اعتمدنا البرنامج الاحصائي Frontier وجرى تقدير معلمات الدالة بثلاث صيغ مختلفة وهي:

1- التقدير بطريقة المربعات الصغرى الاعتيادية Ordinary Least Square (OLS) وهي افضل مقدر خطي غير متحيز Best Linear Unbiased Estimator (BLUE) لمعاملات الأنموذج ماعدا الجزء المنقطع من المحور الصادي B_0 الذي يكون منحازا(10).

2- ولأجل تصحيح تقدير المعامل B_0 لتصبح المعاملات كلها ذات تقدير جيد غير متحيزيتم ذلك بأستخدام طريقة المربعات الصغرى المصححة

Corrected Ordinary Least Square (COLS) .

3- اعادة تقدير معلمات الدالة بطريقة الاحتمال الاعظمMaximum Likelihood (ML) ومنها يتم احتساب الكفاءة التقنية (TE).

ولقياس هذه الكفاءة بأسلوب الحدود العشوائية يتم تحويل الدالة العشوائية في المعادلة (1) الى دالة ترانسلوك Trans logeاو مايسمى بالدالة اللوغاريتمية المتسامية ، وفي هذا الأنموذج شملت المتغيرات التفسيرية المتغيرات السابقة كلها والموضحة سابقا، فضلا عن اعتماد الكميات المنتجة من الشعير كمتغير معتمد ، لذا فإن الأنموذج الدالي المستخدم لقياس الكفاء التقنية بأستخدام اسلوب الحدود العشوائية وبصيغة TL يأخذ الصيغة الآتية:

$$Lnyi = B_0 + B_1 Lnx_1 + B_2 Lnx_2 + B_3 Lnx_3 + B_4 Lnx_4 + B_5 Lnx_5 + B_6 Lnx_6 + B_7 Lnx_7 + B_8 Lnx_8 + B_9(Lnx_1)^2 + B_{10}(Lnx_2)^2 + B_{11}(Lnx_3)^2 + B_{12}(Lnx_4)^2 + B_{13}(Lnx_5)^2 + B_{14}(Lnx_6)^2 + B_{15}(Lnx_7)^2 + B_{16}(Lnx_8)^2 + B_{17}(Lnx_1\ Lnx_2\ Lnx_3 Lnx_4\ Lnx_5\ Lnx_6\ Lnx_7\ Lnx_8) + (vi - ui) \quad \ldots\ldots(3)$$

إذ ان:

yi : اجمالي الكميات المنتجة من الشعير مقدره بالـ طن

X1 : المساحة /بالدونم

X2 : سماد اليوريا/ بالكغم

X : السماد المركب/ بالكغم

X4 : كمية البذور/ بالكغم

X5 : العمل الالي (ساعة)

X6 : العمل اليدوي(ساعة)

X7 : عمر المزارع (سنة)

X8 : سنوات الخبرة (سنة)

vi : متغير عشوائي (الاخطاء غير المسيطر عليها)

ui : متغير عشوائي يمثل عدم الكفاءة التقنية.

وعند التطبيق على البيانات المقطعية فإن حالة عدم الكفاءة تقدر بشكل شرطي بالاعتماد على البواقي Ei ، وان شكل توزيع مكونات البواقي يجب ان يحدد ضمنا. كما ان أنموذج الخطأ العشوائي يكون له جانب خطأ يتبع التوزيع الطبيعي اما الخطأ الناتج عن حالة عدم الكفاءة Ui فيكون له توزيع احادي الجانب (اتجاه واحد) وهذا يأتي في حقيقة ان حالة عدم الكفاءة تأتي من الانحراف السالب عن منحنى الكفاءة الحدودي (2) ومنه تدعى هذه الطريقة ايضا بطريقة الخطأ المركب ومن خلال القواعد االاساسية لنظرية الكفاءة تبين طريقة التحليل الحدودي العشوائي المنحنى الحدودي الذي يمثل مجموعة النقاط الاكثر كفاءة إذ ان المسافة بين كل نقطة والمنحنى تمثل درجة عدم الكفاءة كما يمكن ان تستبعد النقاط المسجلة على المنحنى للسببين الاول وجود اخطاء القياس والثاني يتمثل بوجود صدمات خارجية مثل المتغيرات السياسية والاقتصادية وتطورات الاسواق (8) وبناءً على ماتقدم هدفت الدراسة الى تقدير الكفاءة الفنية بطريقة التحليل الحدودي العشوائي باستخدام دالة الانتاج اللوغارتمية المتفوقة وبالتركيز على مدخلات الانتاج الاساسية للتعرف على مقدار معلمة عدم الكفاءة لكل وحدة انتاجية ممثلة بالمتغير العشوائي وتم الايفاء بذلك بالاعتماد على بيانات جمعت بصورة عشوائية بوساطة استمارة استبانة وبالمقابلات الشخصية من 44 مزارع لمحصول الشعير في قضاء الصويرة للموسم الزراعي 2019-2020.

نتائج تقدير الكفاءة التقنية (TE) بأسلوب الحدود العشوائية(SFA) لمزارع الشعير في عينة البحث للموسم الزراعي 2019-2020

قدرت الكفاءة التقنية (TE) بأسلوب تحليل الحدود العشوائية (SFA) باستخدام الدالة اللوغاريتمية المتسامية (TL) معادلة (3) ، وقد تضمن الأنموذج المتغيرات التفسيرية المشار اليها في تحليل الكفاءة التقنية بموجب دالة الانتاج وهي

(المساجة المزروعة ، كمية سماد اليوريا ، كمية السماد المركب ، كمية البذور ، ساعات العمل الالي ، ساعات العمل اليدوي ، عمر المزارع ، سنوات الخبرة(وتم الحصول على تقديرات لمعلمات المتغيرات التفسيرية لدالة الانتاج اللوغاريتمية المتسامية بثلاث طرائق وهي المربعات الصغرى الاعتيادية (OLS) ، والمربعات الصغرى المصححة .(COLS) وطريقة الاحتمال الاعظم (ML) وثبتت النتائج في الجدول (4) وفيه توضيح لقيم المعلمات للمتغيرات التفسيرية المسؤولة عن التغيرات في المتغير التابع (كمية الانتاج من الشعير) في مزارع عينة البحث.

جدول4. قيم معلمات دالة الانتاج اللوغارتمية المتسامية (TL) بالطرائق الثلاث الامكان الاعظم والمربعات الصغرى المصححة والمربعات الصغرى الاعتيادية.

المعلمة	قيمة المعلمة بطريقة (OLS)	قيمة المعلمة بطريقة (COLS)	قيمة المعلمة بطريقة (ML)
B0	−3.865	−3.471	80.064
B1	1.289	1.289	−4.137
B2	33.694	33.694	7.058
B3	5.813	5.813	−4.200
B4	−4.307	−4.307	4.173
B5	−0.028	−0.028	37.597

B6	0.007	0.007.	−1.137
B7	−74.438	− 74.438	29.959
B8	59.037	59.037	−73.740
B9	−0.014	−0.014	−0.041
Sigma squared	33.506	41.466	65.086
gama	−−−−−−	59.000	99.996
Log like lihood function = −27.213			

ومن الجدول يتبين ان طريقة المربعات الصغرى الاعتيادية (OLS) قدمت كما كان متوقعا تقديرا متواضعا للجزء المنقطع (B_0) اذ بلغت قيمة المعلمة (−3.865) ثم اصبحت في طريقة الامكان الاعظم ((ML) (80.064) المعتمدة في التحليل وهذا يعني انه تم تصحيح الاخطاء وفي نفس الوقت يشيرالى ان هناك مستوى تكنلوجي متبع في انتاج محصول الشعير، وتمثل قيم معلمات المتغيرات التفسيرية للدالة اللوغاريتمية المتسامية المرونات الانتاجية لهذه المتغيرات ، وفيما يأتي وصف عام للقيم العددية لهذه المعلمات ومدى توافقها مع منطق النظرية الاقتصادية على وفق طريقة الامكان الاعظم (ML) التي حققت افضل النتائج مقارنة بالطرائق الاخرى.

1- المساحة المزروعة X_1

جاءت اشارة متغير المساحة المزروعة سالبة والتي تشير الى العلاقة العكسية بين المساحة وكمية الانتاج وهي مخالفة لمنطق النظرية الاقتصادية ، ويعني ذلك ان بزيادة المساحات المزروعة ينخفض الانتاج ،اي ان التوسع في المساحات غير كفوء بسبب ضعف التمويل،اوان جزء كبيرمن المساحات الاضافية المزروعة بالشعيركانت اراضي رديئة ومغطاة بالاملاح لدرجة تفوق درجة تحمل محصول الشعير لذا خصص جزء كبير من تلك المساحات للرعي بسبب ازمة العلف وارتفاع اسعاره .اي ان اغلبها لاتكون مستغلة بصورة مثلى مما يؤدي الى هدر كبير في هذا المورد.

2- سماد اليوريا X_2

جاءت اشارة متغير سماد اليوريا موجبة وهي تعكس العلاقة

الايجابية بين سماد اليوريا والمتغير المعتمد (كمية الانتاج)، فاذا زاد كمية سماد اليوريا بمقدار (1%) سيؤدي الى زيادة الانتاج بمقدار (7.05%) وهذه النتيجة تعد مطابقة للمنطق الفني والاقتصادي اي انه من المنطقي عند زيادة كمية سماد اليوريا فان الكمية المنتجة من الشعير تزداد ايضاً.

3- السماد المركب X_3

من خلال اختبار T يتبين عدم معنوية المتغير وان قيمة المعلمة للمتغير في دالة الانتاج TL تمثل المرونة الانتاجية للمورد اذ بلغت قيمة المرونة له(4.201 -) ، فاذا زاد المورد المستخدم بنسبة (1%) سيؤدي الى تخفيض الانتاج بنسبة (4.201%) وهذه النتيجة تبين ان اشارة المرونة سالبة ومخالفة للمنطق الاقتصادي ومؤكدة التاثير السلبي لهذا المتغيرفي كمية الانتاج ، وهذا يعني ان كمية السماد التي يستخدمها المزارعون تفوق المستوى المطلوب مما يؤكد وجود هدر في استخدام المورد.

4- كمية البذور : X_4

تطابقت اشارة متغيرالبذور البالغة 4.173 مع المنطق الاقتصادي ومؤكدة العلاقة الايجابية بين كمية البذور والناتج اي ان زيادة استخدام البذور بنسبة (1%) يؤدي الى زيادة كمية الانتاج بنسبة (4.173%)

5- العمل الالي : X_5

تبين من خلال اختبار t معنوية المتغير وان قيمة المعلمة للمتغير في دالة الانتاج تمثل المرونة الانتاجية للمورد، وجاءت اشارة متغير العمل الالي موجبة وهي تعكس العلاقة الايجابية بين العمل الالي والمتغير المعتمد، فاذا زادالعمل الالي بمقدار 1% سيؤدي الى زيادة الانتاج بمقدار37.597%

وهذه النتيجة تعد مطابقة للمنطق الاقتصادي .و منطقية ايضا كون محاصيل الحبوب ومن ضمنها الشعير تعتمد وبشكل كبير على العمل الالي .

.

6- العمل اليدوي : X_6

من خلال اختبار t يتبين معنوية المتغير وان قيمة المعلمة للمتغير في دالة الانتاج بلغت (1.137-)، وهذا يعني ان زيادة المورد المستخدم بنسبة (1%) يؤدي الى تخفيض الانتاج بنسبة (1.137%) وهذا يدل على

وجود هدر في استخدام المورد من مزارعي الشعير، وتعد هذه النتيجة مخالفة للمنطق الاقتصادي ولكنها قد تتفق مع الواقع الموجود في مزارع الشعير،اذ تعتمد بشكل بسيط على العمل اليدوي، وان وجد فهو بطالة مقنعة.

7- عمر المزارع : X_7

تطابقت اشارات متغير عمر المزارع (29.959) مع المنطق الاقتصادي مشيرة الى العلاقة الايجابية بين عمر المزارع والناتج (كمية الشعير)، اي ان زيادة عمر المزارع بنسبة (1%) يؤدي الى زيادة الناتج (29.96%).وان المعنوية العالية لهذا المتغيردليل على الاثرالكبيرلمتغير عمر المزارع في انتاج الشعير .

8- سنوات الخبرة X_8

جاءت اشارة متغير سنوات الخبرة سالبة والتي تشير الى العلاقة العكسية بين الخبرة وكمية الانتاج وهي مخالفة لمنطق النظرية الاقتصادية ، اذ ان خبرة المزارع في مجال ادارة العملية الانتاجية له تأثير مباشر على زيادة الانتاج نتيجة لتراكم الخبرة وهذا يعني ان زيادة الخبرة لحد معين له تاثير ايجابي على الانتاج، وقد يكون سبب هذه العلاقة العكسية هو عدم استغلال الخبرات بشكل امثل في تطوير عمل مزارع عينة الدراسة، او قد يعزى ذلك الى الارتباط بين متغيري عمر وسنوات خبرة المزارع.

اما بالنسبة الى معنوية المتغيرات فتعد المعنوية الاحصائية مهمة في تقديرات OLS ولكن ليس من الضروري ان تكون معلمات الدالة المقدرة ML ذات معنوية احصائية وذلك بسبب كون المعلمات المقدرة بطريقة ML تكون كفوءة ومتماسكة لحدود الخطأ ui وصغيرة الحجم بالنسبة لتقديرات المجتمع المأخوذة منه (16). وبلغت الدالة اللوغاريتمية لأقصى احتمال قيمة سالبة (27.213) دلالة على ان هناك تغيرات تقنية تؤثر سلبا في المتغير العشوائي، او ان هناك متغيرات اخرى تؤثر في الكفاءة التقنية لمزارع الشعير غير التي تناولتها الدراسة ، ومن قيم دالة الانتاج اللوغاريتمية المتسامية التي قدر معلمتها على وفق طرائق التقدير(OLS , COLS , ML) التي تمت الاشارة اليها سيتم استخدامها في تقدير قيم الكفاءة التقنية

(TE) لمزارع محصول الشعير كل على حده وكمتوسط للعينة على وفق اسلوب تحليل الحدود العشوائية SFA وباستخدام البرنامج Frontier . قدرت الكفاءة التقنية لمزارعي محصول الشعير على وفق اسلوب الحدود العشوائية (SFA) كما هو واضح في الجدول (5)

جدول 5. نتائج تقديرات الكفاءة التقنية لمزارع الشعير في عينة البحث للموسم الزراعي 2019–2020 بأسلوب الحدود العشوائية (SFA)

الكفاءة التقنية TE%	المزارع	الكفاءة التقنية TE%	المزارع	الكفاءة التقنية TE%	المزارع	الكفاءة التقنية TE%	المزارع
66.37	34	64.58	23	62.85	12	39.45	1
31.45	35	99.15	24	99.16	13	17.62	2
69.52	36	54.47	25	76.68	14	55.41	3
69.52	37	11.90	26	72.52	15	98.90	4
74.21	38	17.02	27	43.51	16	86.53	5
66.37	39	44.36	28	35.46	17	18.27	6
31.45	40	41.65	29	76.68	18	44.36	7
69.52	41	66.06	30	69.01	19	54.06	8
69.52	42	61.92	31	52.92	20	62.47	9
55.36	43	55.62	32	88.88	21	24.18	10
87.61	44	74.21	33	85.48	22	69.63	11

ومنه يتبين ان مستويات الكفاءة التقنية لمزارعي محصول الشعير في عينة البحث تراوحت بين حد ادنى بلغ (11.90) في المزرعة (26) وحد أعلى بلغ (99.16%) في المزرعة (13) وبمتوسط للعينة قدره (58%) وهذه النتيجة لمستوى الكفاءة التقنية لمزارعي محصول الشعير في عينة البحث تشير الى ان مزارعي الشعير بامكانهم زيادة انتاجهم بنسبة (42%) من دون زيادة اي قدر من الموارد الاقتصادية المستخدمة في زراعة محصول الشعير وبمعنى آخر ان هذه المنزارع بإمكانها انتاج الناتج السابق نفسه بموارد اقل تعادل ما يقارب

(42%) من الموارد المستخدمة ، وان متوسط الكفاءة التقنية في هذه المزارع يدل على ان هناك نسبة انحراف في الانتاج الفعلي عن الانتاج الامثل بنحو (42%) وبامكان المزارعين تحقيقه لو استخدمت الموارد الاقتصادية المتاحة استخداما امثل.

وتبين نتائج البحث على وفق اسلوب الحدود العشوائيه ان مزارع الشعير لم تحقق كفاءة اقتصادية كاملة (100%) ومن ثم فان كل مزارع العينة لم تنتج على منحني الامكانيات الانتاجية وتبتعد عنه بنسب مختلفة وهذا يعطي لهذه المزارع فرصة تخفيض كميات الموارد الاقتصادية المستخدمة للحصول على مستوى الانتاج نفسه، او استخدام كميات الموارد المستخدمة للحصول على مستوى انتاجي أعلى. وخلاصة القول ان مستويات الكفاءة التقنية وعدد مزارع الشعير المحققة لهذه المستويات ونسب كل منها

في عينة البحث ثبتت في جدول (6) ومنه يتضح ان عدد مزارع الشعير التي حققت مستويات للكفاءة التقنية تراوحت بين (11%) الى (40%) كان عددها (8) مزارع واحتلت المرتبة الثالثة وشكلت نسبة (18.18%) من اجمالي مزارع عينة البحث.

جدول 6. مستويات الكفاءة التقنية لمزارعي محصول الشعير واعداد المزارعين ونسب كل منها في عينة البحث للموسم الزراعي 2019 –2020

مستويات الكفاءة التقنية TE	عدد مزارع الشعير	%100
≥ TE ≥11 40	8	18.18
≥ TE ≥41 60	11	25.00
≥ TE ≥61 80	18	40.91

81 فأكثر	7	15.91
المجموع	44	100

وبلغ عدد مزارع الشعير المحققة لمستويات الكفاءة التقنية (81% فاكثر) (7) مزرعة واحتلت المرتبة الرابعة وشكلت نسبة حوالي (16%) من اجمالي مزارع عينة البحث ويلحظ بان لايوجد مزارع تنخفض فيها مستويات الكفاءة التقنية عن (11.90) في مزارع عينة البحث،وهذه النتائج التي تم التوصل اليها مقاربة للنتائج التي توصل لها باحثون اخرون (4،11).

الأستنتاجات والتوصيات :

على ضوء النتائج التي توصل لها البحث تم الاستنتاج بأن مزارعي محصول الشعير لم يعتمدوا الاسلوب العلمي في استخدام الموارد واختيار التوليفة المواردية المثلى، مما يؤدي الى عدم تحقيق مستويات من الكفاءة التقنية مقارنة بأغلب الدول المنتجه للمحصول ،وان متوسط الكفاءة التقنية المُقدر بإسلوب تحليل الحدود العشوائيه (SFA) على وفق دالة الإنتاج اللوغاريتميه المتساميه التي تم الحصول عليها تدل على ان هناك هدراً في استخدام الموارد بلغ (42%) من اجمالي الكميات المُستخدمة ،علما أن ثلاث مزارع فقط حققت كفاءة تقنية تفوق (90%). وان مزارع العينة لم تحقق كفاءة اقتصادية كاملة 100%ومن ثم فان كل المزارع لم تنتج على منحنى الامكانيات الانتاجية وتبتعد عنه بنسب مختلفة. من اكثر عناصر الانتاج تاثير بانتاج الشعير هو سماد اليوريا.

قلة الامطار وشحة المياه ادى ارتفاع اسعار العلف مما ادى الى تحويل جزء كبير من المساحات المزروعة الى اعلاف اخضر.

وان دعم اسعار المحصول لم يكن كافياً في توسيع المساحات المزروعة مما يشير الى عدم وجود سياسة واضحة في التوسع في المساحات المزروعة بالمحصول، وانعكس هذا الانخفاض في المساحات سلبا على الثروة الحيوانية، كما ان استخدام التكنلوجيا في زراعة الشعير لم يكن مصحوباً بتطور العمل البشري وتوفير الظروف المالية مما انعكس على عدم رفع معدلات الانتاج بشكل واضح، وان التقدم التكنلوجي لايتمثل في المكائن والالات فقط بل يجب توفير اصناف وطرائق وتقنيات ملائمة لزراعة محصول الشعير، لذا يوصي الباحث باتباع الاساليب العلمية في ادارة هذه المزارع واعادة توزيع الموارد الاقتصادية بما يضمن تحقيق

نفس المستوى من الانتاج او اكثر في ظل خفض التكاليف، دعم مزارعي الشعير بموارد الانتاج لا سيما البذور المحسنة والاسمدة وفي اوقاتها المحددة.

دعم الاعلاف وتوفيرها للمربين مما يساهم بزيادة النسبة التسويقي تزويد المزارعين بالمرشات الثابتة والمحورية لتفادي مشكلة المياه

توفير مراكز تسويقية صغيرة في مناطق الانتاج لتشجيع المزارعين على التسويق لا سيما اصحاب الحيازات الصغيرة .وضرورة تطوير استخدام الوسائل والتقنيات الحديثة التي من شأنها رفع مستوى انتاجية الدونم وخفض التكاليف بما يضمن استغلال الموارد الانتاجية استغلال امثل يحقق الكفاءة التقنية.

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"Measuring technical efficiency using SFA random border analysis of barley farms in Wasit Governorate / Iraq"

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ABSTRACT:

The Iraqi sector suffers from many problems, weakness management performance of its duties is one of the most important problems, which leads to failure to achieve the optimal use of the production factors and higher levels of agricultural production. Therefore, the aim of the research is to measure the TE technical efficiency using analysis of the Stochastic Frontier Approach (SFA). According to the transcendental logarithmic production function TL, a random sample of 44 farmers for Barley crop in Wasit Governorate/Al-Suwaira for the season 2019-2020, and the model included the production quantity as a dependent variable as well as the independent variables (area, quantity of urea fertilizer, quantity of compound fertilizer, amount of seeds, working hours, manual working hours). As well variables that are related to farm management (the age farmers, years of experience), the results indicated that the OLS method given an estimate of B_0 (-3.87), and in the COLS and ML, it (-3.47) and (80.06). The signal of the studied variables, comes identical to the logic of economics, except area, compound fertilizer, manual working hours, and experience. Average TE is 58%, this indicates that there is a deviation in the actual production for the optimum output of about 42%, and could be achieved if farmers used the available economic resources in optimal ways, this means that the farmers can increase their production by 42% without increasing any number of economic resources, and the logarithmic function of the ML is (-27.21), an indication that there are technical changes adversely affect in random variable thus in TE.

On this basis search recommended following modern scientific methods in the farm's management and re-distribution economic resources so as to ensure the same level of production or more while reducing costs as well as developing the use of modern means and techniques in Barley farms.

Key Words: Astochastic frontier analysis (SFA), Technical efficiency.

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عدد خاص / مؤتمر العلوم الطبيعية والتطبيقية الدولي الحادي عشر

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"Effect of urinary tract infections with *Klebsiella pneumoniae* on some immunological variables for patients admitted to Ramadi General Hospital"

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Abstract:

Background Urinary tract infections in women are more common, as the urethra or urethra is short, which makes the distance for bacteria to reach the bladder shorter, and urinary tract infections are transmitted to women when they have sex with a man who has a urinary tract infection, and not often vice versa. It is also worth noting that With age, UTIs in men become more common. Methodology **Five mL of blood was withdrawn from the brachial vein by medical syringes and then divided into two parts. Then, 1 ml was placed in single-use test tubes containing 2-EDTA and kept in the refrigerator until the total and differential count of white blood cells were tested. The second section was for chemical and immunological tests. In sterile plain plastic tubes free of EDTA, the samples were transferred to the laboratory, the tubes were left for blood clotting, and the blood-containing tubes were placed in a centrifuge for 10 minutes at a speed of 3,000 rpm. The blood was separated by a series of blood serums using a sterile Pasteur pipette. Then distribute the serum into small test tubes of equal volumes (120 l). Several immunological tests were carried out, including Interlukin 1 and 2.** Result effect of infection with urinary tract infections by Klebsiella bacteria on the concentration of IgM and IgG antibodies, where an increase in the concentration of IgM antibodies was observed in men more than its concentration in women where it reached a concentration of 13.1 compared to its concentration in infected women Urinary tract infections reached 12.9 compared to 1.5 in control, and we did not notice an increase in IgG antibody concentrations in either infected or control women or men. The decrease in the level of globulin IgG and IgM in patients with renal failure.

Keywords: Urinary tract infections, klebseilla pneumonia.

Introductions

The causes of chronic renal failure are multiple, including acute glomerulonephritis, obstruction (urinary tract, hypertension), excessive use of some medications, and diabetes. The occurrence of pathological infections associated with disorders in the immune system, such as the total and differential number of white blood cells [1,2] Bacterial and viral infections account for 7%, polycystic nephropathy 3%, urinary tract obstruction 2%, and other unknown intervening causes (14%). [3,4] Clinical symptoms of kidney failure begin to appear in all organs of the body because the kidney disorder has a general and comprehensive effect on the rest of the body's organs.[5] Symptoms include fatigue, mental and physical exhaustion, lack of appetite, itching, and weakness.[6] Sexual urination, especially at night, peripheral neuritis, pallor of the skin, vomiting, nausea, heart failure, convulsions, and coma, osteomalacia, decreased urine output, swelling of the legs and ankles, and fluid retention caused by kidney failure, all of which indicate uremia, the clinical syndrome.associated with kidney function deterioration due to renal failure and defined as a toxic condition represented by the presence of urine components in the blood [8,9] in addition to other symptoms such as vitamin D deficiency, anemia, and hypertension) in the blood [10,11].One of the most important complications of chronic renal failure is anemia. Its severity is proportional to the duration of the disease and the duration of dialysis treatment, and it varies according to age and gender.[13] Others include a deficiency in the hormone erythropoietin, which is responsible for stimulating the bone marrow to produce red blood cells (RBCs), malnutrition, blood urea poisoning, and the occurrence of hematuria due to the high level of urea and creatinine in the blood resulting from the failure of the kidneys to secrete them. [14,15]

Methodology:

Urine collection

Urine samples were collected in sterile glass bottles and based on mid-stream urine. These samples were cultured on MacConkey agar media, Mannitol-salt agar and blood agar, and the occlusion was incubated at 37°C for 24 hours for the purpose of diagnosis. Bacteria growing on the media.

Identification of microorganism

Cultural characteristics

Blood agar, MaconKey agar, and manitol salt agar were used to examine colony morphologies, culture properties, and growth or lack thereof on the various medium.

Morphological characteristics

The phenotypic characteristics are studied through the work of Gram stain from different culture media, and the shape and size of colonies, color .

Collecting of blood

Five mL of blood was withdrawn from the brachial vein by medical syringes and then divided into two parts. Then, 1 ml was placed in single-use test tubes containing 2-EDTA and kept in the refrigerator until the total and differential count of white blood cells were tested. The second section was for chemical and immunological tests. In sterile plain plastic tubes free of EDTA, the samples were transferred to the laboratory, the tubes were left for blood clotting, and the blood-containing tubes were placed in a centrifuge for 10 minutes at a speed of 3,000 rpm. The blood was separated by a series of blood serums using a sterile Pasteur pipette. Then distribute the serum into small test tubes of equal volumes (120 l). Several immunological tests were carried out, including Interlukin 1 and 2.

Result and discussion

Table 1 Effect of urinary tract infections by *klebsiella pneumonia* on the concentration of antibodies in both men and women

	gender	case of patient	Mean	Std. Deviation
IgM concentration	male	patient	13.1000	1.52388
		control	1.5900	1.18645
		Total	7.3450	6.05227
	female	patient	12.9000	1.19722
		control	1.1510	.82206
		Total	7.0255	6.10943
	Total	patient	13.0000	1.33771
		control	1.3705	1.01863
		Total	7.1853	6.00463
IgG concentration	male	patient	8.0900	2.10631
		control	2.3900	2.52870
		Total	5.2400	3.69871
	female	patient	8.9000	1.79196
		control	5.3000	9.19227
		Total	7.1000	6.70499

Table 1 shows the effect of infection with urinary tract infections by Klebsiella bacteria on the concentration of IgM and IgG antibodies, where an increase in the concentration of IgM antibodies was observed in men more than its concentration in women where it reached a concentration of 13.1 compared to its concentration in infected women Urinary tract infections reached 12.9 compared to 1.5 in control, and we did not notice an increase in IgG antibody concentrations in either infected or control women or men. The decrease in the level of globulin IgG and IgM in patients with renal failure. The decrease in the level of immune globulin concentration in patients with chronic renal failure may be attributed to several reasons, including the accumulated uremic toxin, which inhibits the synthesis of immune globulins in patients with chronic renal failure, as well as a decrease in the numbers of B-cells, which are the basis for the synthesis of globulins. As an immune response against different antigens, and that taking some types of antibiotics and some types of steroids contributes to a decrease in globulin concentrations in the serum of patients with chronic renal failure by inhibiting its re-synthesis The concentration of IgM globulin was slightly lower in the presence of bacteria due to the fact that IgM is the first immunoglobulin produced in response to infection and that the severe bacterial infections suffered by kidney patients led to a decrease, so the decrease of IgM confirms its importance in the defense of the host because IgM contains 10 sites for antigen incorporation

Table 2 ANOVA table of urinary tract infections by *klebsiella pneumonia* on the concentration of antibodies in both men and women

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	IgM concentration	1353.616[a]	3	451.205	309.097	.000
	IgG concentration	261.846[b]	3	87.282	3.543	.024
Intercept	IgM concentration	2065.113	1	2065.113	1414.701	.000
	IgG concentration	1522.756	1	1522.756	61.813	.000
gender	IgM concentration	1.021	1	1.021	.699	.409
	IgG concentration	34.596	1	34.596	1.404	.244
case	IgM concentration	1352.453	1	1352.453	926.495	.000
	IgG concentration	216.225	1	216.225	8.777	.005
gender * case	IgM concentration	.143	1	.143	.098	.756
	IgG concentration	11.025	1	11.025	.448	.508
	IgG concentration	1148.704	39			

a. R Squared = .963 (Adjusted R Squared = .960)
b. R Squared = .228 (Adjusted R Squared = .164)

Table 2 Analysis of variance of the effect of infection with Klebsiella bacteria that causes urinary tract infections on the concentrations of antibodies in men and women compared to the control, where it was noted that there were no significant differences between the concentrations of IgM and IgG antibodies depending on gender, meaning that there were no significant differences between Infected women and men with urinary tract infections, and it was also noted that there is a significant difference between the infected and the control, and there is no significant difference for the interaction of sex with the pathological condition As shown in Figure 1 and 2 . The presence of "inactive" natural IgM antibodies in the blood of normal individuals provides a primary defense against infection and promotes healing of infected cells. Thus, a decrease in IgM in glomeruli indicates cellular damage and may warn that this damage exceeds the ability to repair.

Through IgG antibodies, it is possible to know if the infection was previous, so the antibody of the type IgG increases, and as for the IgM antibodies, it indicates the recent infection, so the antibody of the type IgM increases.

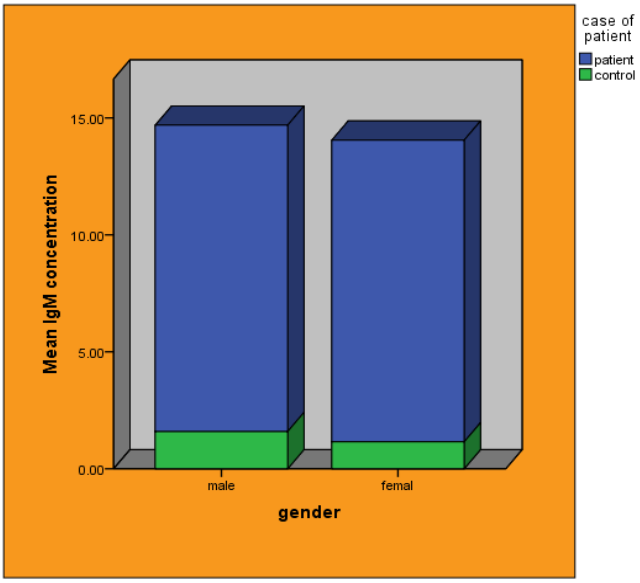

Figure 1effect of urinary tract infections by *klebsiella pneumonia* on the concentration of IgM antibodies in both men and women

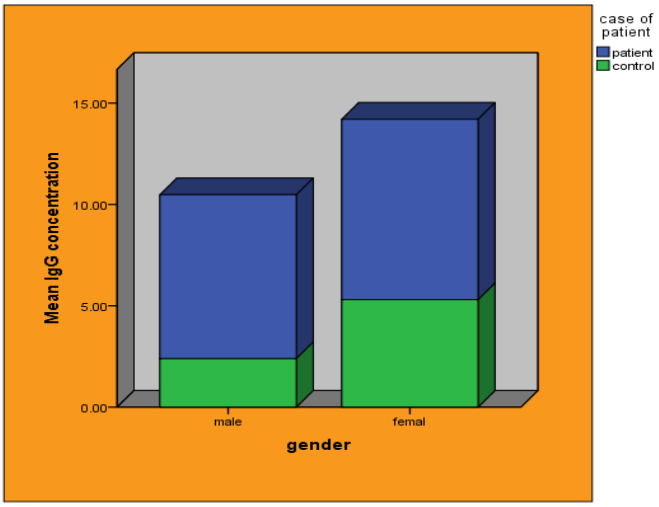

Figure 2effect of urinary tract infections by *klebsiella pneumonia* on the concentration of IgG antibodies in both men and women

Table 3 effect of urinary tract infections by *klebsiella pneumonia* on the concentration interleukin 1 and 2 in both men and women

	gender	case of patient	Mean	Std. Deviation
interleukin 1 concentration pg/ml	male	patient	10.40	1.897
		control	3.20	.789
		Total	6.80	3.955
	female	patient	12.40	1.265
		control	5.60	1.506
		Total	9.00	3.742
	Total	patient	11.40	1.875
		control	4.40	1.698
		Total	7.90	3.960
interleukin 2 concentration pg/ml	male	patient	62.70	10.436
		control	17.60	5.190
		Total	40.15	24.487
	female	patient	62.70	14.712
		control	62.80	5.391
		Total	62.75	10.784

Table 3 shows the effect of infection with Klebsiella bacteria that causes urinary tract infections on the concentration of interleukin 1 and 2 in both sexes, where there was an increase in the concentration of interleukin 1 and 2 in women with urinary tract infections, where the concentration reached 12 and 62 respectively compared to its concentration in infected men also, where its concentration reached 10 and 60, respectively, compared to the control, which was 3 and 17, respectively Immunodeficiency in patients with renal failure is accompanied by changes in immunity that depends on antibodies, and as a result of these changes, the proportion of immune stimuli such as interleukin and NB increases in patients with renal

failure, due to increased secretion and less excretion from the kidneys, thus giving a reflection of the deficiency in the immune functions of T lymphocytes, which leads Decreased production of antibodies. The reason for the high concentration of this interleukin is that it belongs to the IL-1 group, as the pre-inflammatory kinetics (Pro-inflammatory cytokine) increase rates during immunopathies and infections of different types of bacteria, as bacterial infections stimulate macrophage cells to release inflammatory mediators such as IL- 1, IL-12, TNF- and L33, These inflammatory mediators are essential stimuli for the inflammatory response and for various local infections in the body, which leads to their increase in the blood, the numbers of white blood cells increase, and neutrophils are attracted to the affected area to kill germs

Table 4 ANOVA table of effect of urinary tract infections by *klebsiella pneumonia* on the concentration interleukin 1 and 2 in both men and women

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	interleukin 1 concentration pg/ml	538.800[a]	3	179.600	88.813	.000
	interleukin 2 con.	15277.700[b]	3	5092.567	53.415	.000
Intercept	interleukin 1 con. pg/ml	2496.400	1	2496.400	1234.484	.000
	interleukin 2 con.	105884.100	1	105884.100	1110.608	.000
gender	interleukin 1 concentration pg/ml	48.400	1	48.400	23.934	.000
	interleukin 2 con.	5107.600	1	5107.600	53.573	.000
case	interleukin 1 concentration pg/ml	490.000	1	490.000	242.308	.000
	interleukin 2 con.	5062.500	1	5062.500	53.100	.000
gender * case	interleukin 1 concentration pg/ml	.400	1	.400	.198	.659
	interleukin 2 con.	5107.600	1	5107.600	53.573	.000

a. R Squared = .881 (Adjusted R Squared = .871)

b. R Squared = .817 (Adjusted R Squared = .801)

Table 4 Analysis of variance for the effect of infection with urinary tract infections with Klebsiella bacteria on the concentrations of interleukin 1 and 2 in both sexes, where there were significant differences in terms of the concentration of interleukin between infected women and men with urinary tract infections, which means that there is a significant significant difference between women and men in terms of the concentration of interleukin 1 and 2, and there is also There is a significant difference between healthy and injured for both sexes, and there is no significant difference for the treatment of the interaction between sex and disease state As shown in Figure 3 and 4. Presence of Gram-negative bacteria possessing LPS protein that greatly stimulates the release of inflammatory cytokines that promote kidney disease. Inhibition of these

inflammatory cytokines can alleviate kidney tissue injury and thus inhibition of these cytokines helps early anti-inflammatory treatment to improve kidney function. Nitric Oxide compound It has the ability to get rid of staphylococcus bacteria, many cellular kinetics such as IL-1, INF-y have the ability to activate nitric oxide, which in turn acts as phagocytes that work to kill bacteria, and interleukin is produced mainly by T and B lymphocytes and immune cells Such as dendritic cells, macrophage cells, mononuclear cells, natural killer cells, and epithelial cells

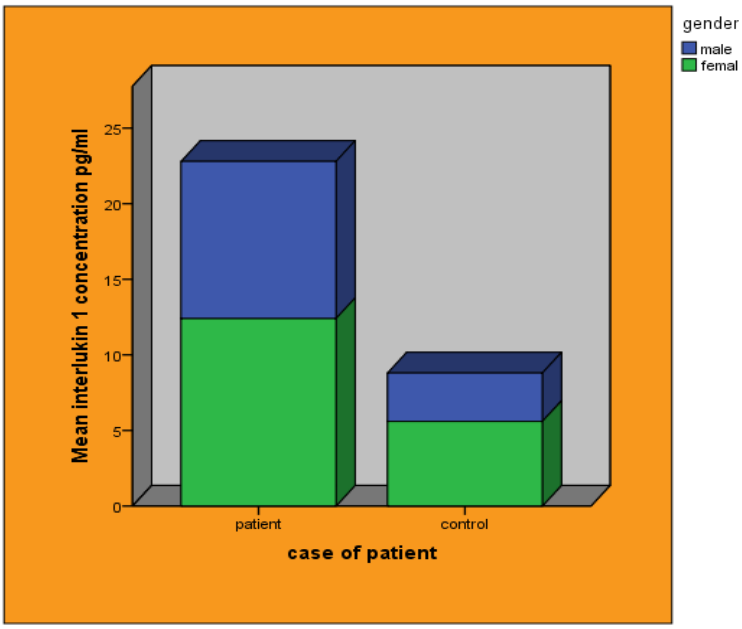

Figure 3 effect of urinary tract infections by *klebsiella pneumonia* on the concentration interleukin 1 in both men and women

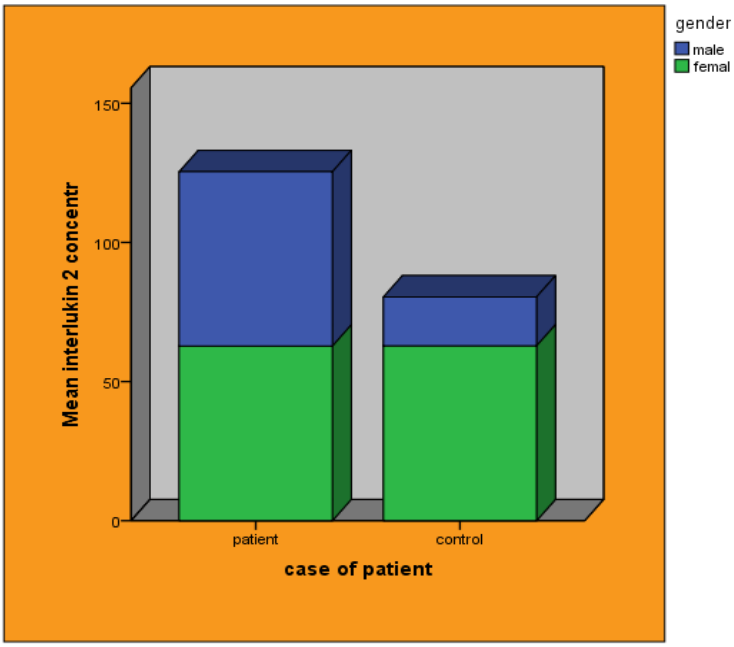

Figure 4 effect of urinary tract infections by *klebsiella pneumonia* on the concentration interleukin 2 in both men and women

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"The role of different mutations and recombination in genome lead to modify proteins enveloped and spikes among corona viruses"

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Abstract:

Coronaviruses (CoVs) chiefly ingredient enzootic infections in birds and mammals but, in the past two decades, effort shown to be capable of infecting humans as well. Unconventional of the circulating corporeal unhealthy viruses are enveloped all over a lipid bilayer, and deprecate their wish cells by influencing the fusion of the viral envelope surrounding the cell membrane. Coronaviruses coded for the positive-sense RNA genome of ~30 kb, also encoded for different types of replicase and supplement open reading frames turn are structurally unique, and encode peculiar enzymatic functions among RNA viruses. These viruses undertake lavish or medicine throng ranges, hinting at the another of varied strategies involved in the targeting and regulating multitude inherent that released in responses to the following viral infection. as a parcel out, SARS-CoV parcel out, we evaluate the factual information on the cleverness of coronaviruses to harmonize a copious normal of novel viral proteins turn this way for the benefit, serve , and/or disorganize host cell signaling and nuclear import machinery for the benefit of virus replication. And these proteins prowl burst forth with the immune system to either stop a recognition or enhance one as part of their pathogenicity.

Keywords: COVID-19, protein E, SARS-CoV2

Introduction;

Coronaviruses (CoVs) are named for the crown that look like spikes on their surface. (Order Nidovirales, grounding Coronaviridae and subfamily Coronavirinae) that are enveloped viruses of positive sense, their genome with single-stranded RNA. The sizes of genome ranging about 26 to 32 kilobases (kb) in length, CoVs undertaking A- genomes for RNA viruses, contains 14 (ORFs) and Viruses are multimolecular assemblies that range from small, regular, and simple to large, pleiomorphic and complex. They synthesized from virus-specified proteins and nucleic acids (1)

Those virion comprises of the nucleocapsid center encompassed by the envelope holding three proteinaceous membrane with spike (S), membrane (M) and envelope (E) which are normal to constantly on parts of the class Also there need aid other diverse sorts from claiming proteins as stated by genus (table 1). In light of hereditary Furthermore antigenic criteria, CoVs bring been composed under four primary sub-groupings from claiming coronaviruses, known as alpha, beta, gamma, Also delta: α-CoVs, β-CoVs, and γ-CoVs these infections need aid gathered with two other families, the Arteriviridae and the Roniviridae, under those request Nidovirales. This order will be not In light of structural similarities (2, 3) table (2).

Table (1): Types of proteins

Protein	Function
N Protein	role as nucleic acid-binding proteins

M Protein (previously known as E1 protein)	The most abundant envelope protein. It is the "building block" of the corona virion
E protein (previously known as sM protein)	Minor component of the coronaviral envelope.
S protein (previously known as E2)	constitutes the spikes,
"accessory" proteins,	important for viral–host interactions and thus contribute to viral stability and/or pathogenesis in vivo

Table (2): Groups of corona virus with host and caused disease

Group	Virus	Host	Disease
1	Feline coronavirus (FCoV)	Cat	Respiratory infection/enteritis/peritonitis/systemic enteritis
	Canine coronavirus (CCoV)	Dog	Enteritis
	Transmissible gastroenteritis virus (TGEV)	Pig	Enteritis
	Porcine epidemic diarrhea virus	Pig	Enteritis
	(PEDV)		
	Porcine respiratory coronavirus (PRCoV)	Pig	Infections related to respiratory tract
	Human coronavirus (HCoV)-NL63	Human	Respiratory infection
	Human coronavirus (HCoV)-229E	Human	Respiratory infection
2	Murine hepatitis virus (MHV)	Mouse	Enteritis/ encephalitis/ hepatitis/respiratory infection
	Rat coronavirus (RCoV)	Rat	Respiratory infection

	Bovine coronavirus (BCoV)	Cow	Respiratory infection/enteritis
	Hemagglutinating encephalomyelitis virus (HEV)	Pig	Enteritis
	Human coronavirus (HCoV)-OC43	Human	Respiratory infection
3	Infectious bronchitis virus (IBV)	Chicken	Respiratory infection/enteritis
	Turkey coronavirus (TCoV)	Turkey	Enteritis
?	Severe acute respiratory syndrome-associated coronavirus (SARS-CoV)	Human	Respiratory infection/enteritis

Those coronavirus genomes will be extensive by and large encodes three wide protein classes. Virions are approximately 90 on 120 nm in diameter Furthermore hold An lipid bilayer encompassing a helical nucleocapsid construction that protects the genome. A few structural proteins would encode inside the soundness virion, also these incorporate those 180/90-kDa of spike (S) protein, an 8-kDa envelope (E) protein, a ~50- should 60-kDa nucleocapsid (N) protein and the ~23-kDa film (M) protein. Another class of genes that encodes for the accessory alternately group-specific proteins (figure 1). These proteins would commonly interesting with every specific coronavirus strain and vary Around SARS-CoV, MHV and the other human coronaviruses (figure 2).

In case of SARS-CoV, ORF7a/b, ORF3a and ORF6 are accounted for virion proteins. Every protein principally assumes a part in the construction of the infection molecule, yet they are likewise associated with different parts of the cycle of replication. S protein ties to a receptor called angiotensin converting enzyme 2 (ACE2) and ensuing combination between the viral and host cell layers to encourage viral entry into the host cell (5). In contrast to the next major primary proteins, N is the lone protein that capacities principally to tie to the CoV RNA genome, making up the nucleocapsid. Although the fact that N is engaged generally with measures identifying with the genome of the virus, it is additionally engaged with another parts of the CoV replication cycle and the host cell reaction to the infection of virus. Curiously, confinement of N to the endoplasmic reticulum (ER)- Golgi area has proposed the capacity for it in get together and sprouting. In any case, passing expression of N have been appeared to generously build the creation of infection like particles (VLPs). In some CoVs, proposing that it probably won't be needed for envelope arrangement. (6).

The last general classification of Covid genes encodes the replicase proteins, additionally called (nonstructural proteins). These proteins are encoded in the 5′-most 66% of the genome of Covid, which is fundamental for

polyprotein handling, replicase complex arrangement, and productive infection replication (7). All the more as of late, it is turning out to be certain that the replicase proteins may likewise encode basic destructiveness determinants that control infection development proficiency as well as straightforwardly draw in the host proteome to straightforwardly potentiate pathogenic systems and manage sickness severity (8).

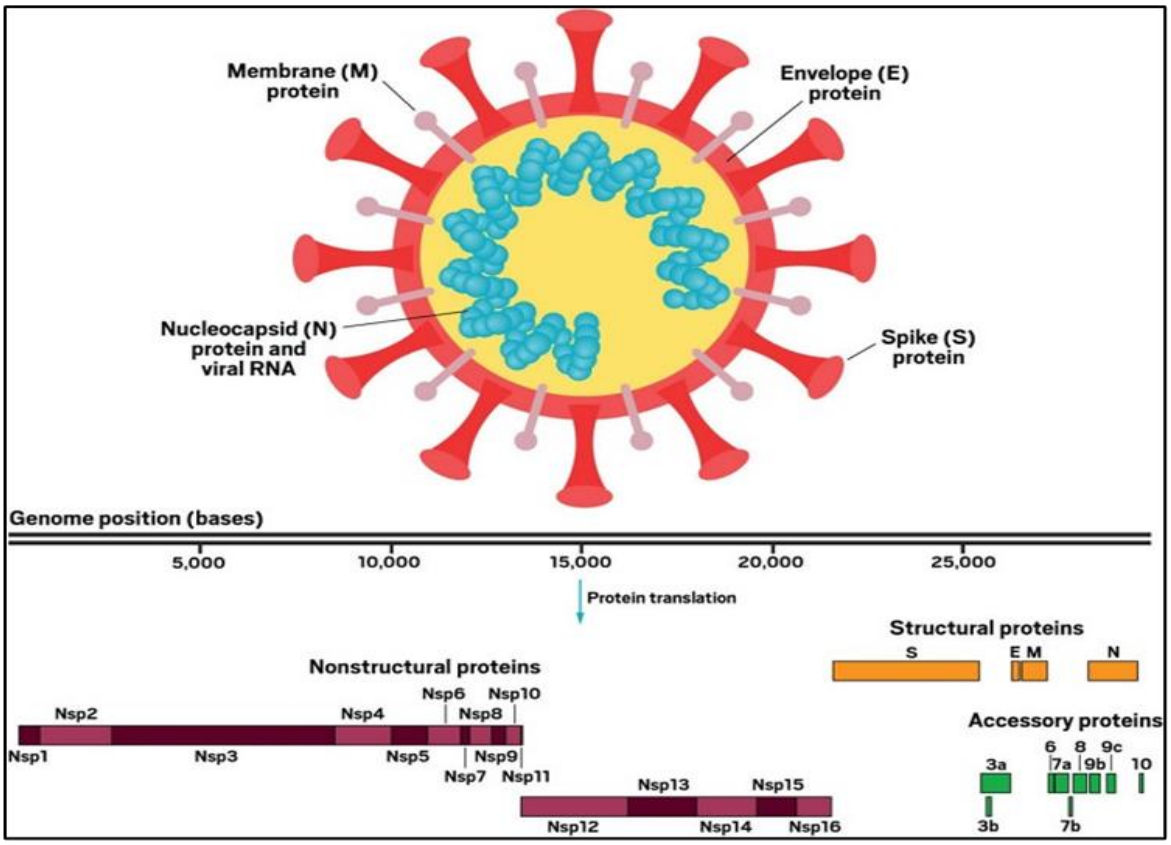

Figure (1): different types of coronavirus proteins (3)

coronaviruses principally infect birds and mammals, causing an assortment of deadly sicknesses that especially sway the farming industry. They can likewise infect people and cause diseases to differing degrees, from upper respiratory tract infections (URTIs) taking after the basic cold, to bring lower respiratory tract infections (LRTIs) like bronchitis, sever acute respiratory syndrome (SARS) and pneumonia (4).

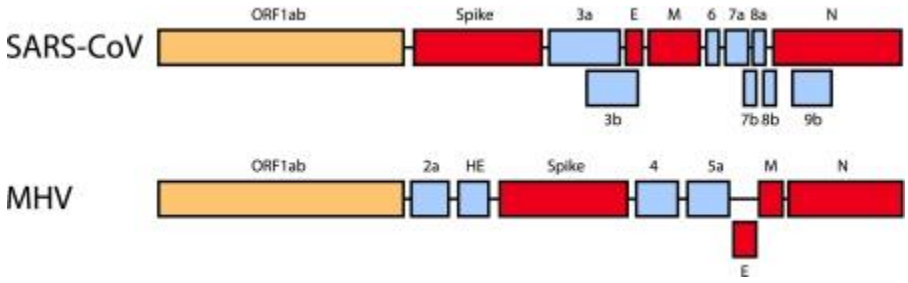

Figure (2): SARS-CoV and MHV genome structure. The genome structure of coronaviruses is very conserved among all known coronaviruses. (5)

Virus serotypes changes

Viruses are interminably evolving due to genetic selection. Their experience inherited transforms through change or mutation and real inherited progressions through recombination. Error or transformation hereditary happens at a hesitate is united in the viral genome. An RNA-based metagenomic next- stage sequencing methodology need been connected should depict its entirety genome, which will be 29,881 bp in length (GenBank no. MN908947) that coded for 9860 amino acids (9).

Two basic mechanisms that caused modification proteins are included: transformation or may be considered as mutations and recombination. Modifications in the hereditary material of the infection particles may prompt changes in the capacity of viral proteins. Such changes may bring about the production of new popular serotypes or viruses of modified destructiveness. Viruses with DNA genetic material have change rates as eukaryotic cells since, as eukaryotic DNA polymerases, viral replicatory compounds have editing functions. The mistake rate for DNA infections particles has been determined to be 10-8 to 10-11 blunders for each consolidated nucleotide. With this low change rate, replication of even the most intricate DNA viruses, which have 2 × 105 to 3 × 105 nucleotide sets for each genome, will create freaks rather infrequently, maybe once in a few hundred to numerous thousand copies of genome. But viruses with RNA genetic material, notwithstanding, come up short on an editing function in their replicatory enzymes, and some have mutations rates that are numerous significant degrees higher—10-3 to 10-4 blunders for each consolidated nucleotide. Indeed, even the most straightforward RNA infections, which have around 7,400 nucleotides for each genome, will create freaks every now and again, maybe as frequently as once per genome duplicate (10)

Not all changes or error which happen in genetic material that persevere in the virus's populace. Mutations that meddle with the fundamental elements of connection, infiltration, uncoating, replication, gathering, and delivery don't allow mis-replication and are quickly lost from the populace. In any case, due to the excess of the genetic code, numerous transformations are impartial, coming about either in no adjustment in the viral protein or in substitution of an amino corrosive by practically comparative amino acid. Just mutations that don't disable fundamental viral function can endure or get fixed in an infection populace (11).

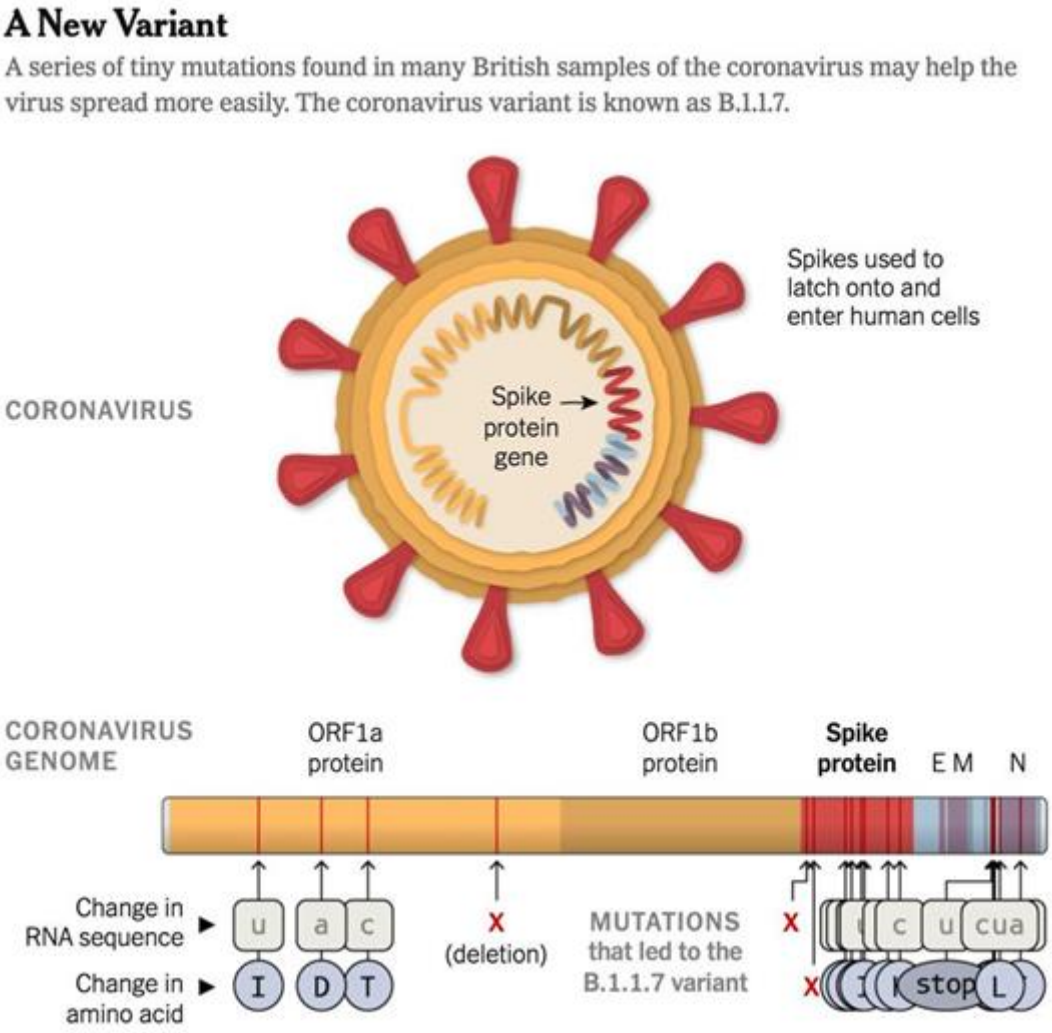

Figure 3: mutations and recombination in corona virus (11)

Functions of the S protein

The S protein on the outside membrane of the viruses is a key element included in infection, the trimeric class I TM glycoprotein (S protein) answerable for viral section, and it is available completely sorts of HCoVs, exactly as inother infections, for instance, flu infection (flu hemagglutinin, HA), (HIV glycoprotein 160, Env), (paramyxovirus F) and (Ebola infection glycoprotein). As in other corvids, S protein of SARS-CoV-2 interferes receptor recognition, cell combination and correlation pending viral disease, S protein tie to receptor by the S1 space incorporate RBD while the S2 which contain HR capable on infection combination. The S protein key part in viral disease shows that it is a possible topical for immunization improvement, counter acting agent impeding treatment, and little particle inhibitors (12)

The S protein will be those fundamental antigen part on the whole structural proteins for SARS- CoV-2. Dissimilar to other practical proteins for SAS-CoV-2, it is responsible for prompting host immune response, as well as nAbs focusing on S protein because of deindustrialization, innovation developed, and protective resistance against viral infection. Comparable with MERS-CoV and SARS-CoV, examination on nAbs proteins of SARS-CoV-2 principally incorporates mAbs, single-chain variable locale fragments, antigen-binding fragments what's more single-domain antibodies (Nbs), which target S1 RBD, S1-NTD, alternately

S2 locales on keep S2-mediated combination. On the other hand, numerous SARS-CoV-2 immunization sorts need aid under development, involving RNA/DNA-based formulations, adenovirus-based vectors, recombinant viral epitopes, furthermore purified inactivated virus (13).

Human and risk degree of respiratory diseases

Human coronaviruses were initial recognized in the mid-1960s. There would about hundreds of coronaviruses, be that only seven sources are trusted which identified that effect people. Those regular human seven coronaviruses which might infect people are: OC43 (beta coronavirus) HKU1 (beta coronavirus); 229E (alpha coronavirus); NL63 (alpha coronavirus). Also there are other human corona viruses: MERS-CoV (the beta coronavirus which makes center east respiratory Syndrome, or MERS); SARS-CoV-2 (the novel coronavirus that reasons coronavirus ailment 2019, SARS-CoV (the beta coronavirus which makes extreme intense respiratory syndrome, or SARS); alternately COVID-19). Individuals near those globes ordinarily get infected with human coronaviruses OC43, 229E, HKU1 and NL63. (14).

Here and there coronaviruses that infect animals could advance What's more make human disease and also get another types coronavirus. Three later cases for this need aid 2019-nCoV, SARS-CoV, Also MERS-CoV. (15).

Four human coronaviruses only cause mild cold- or flu-like symptoms. one alteration coronaviruses positions close by intensive meditation, there are four rotation coronaviruses are circulating in the population currently. They substitute usual mild symptoms and accumulate they are obliged for an estimated only one quarter of all seasonal colds. Whereas, ever after period, an experimental coronavirus emerges stray go-between's fierce adversity as was in the position alongside SARS-CoV in 2003, MERS-CoV in 2008 and nowadays, SARS-CoV-2 (14).

"SARS-CoV-2 viruses are most closely related to SARS-CoV, that happens to be the beating characterized coronavirus in structure of epitopes, classically, human coronaviruses 229E and OC43 were viewed as causing mild upper respiratory tract infections. Into the bargain, organism models of woe were absent, shimmer unfold suitably in identifying the determinants that regulate disease outcomes. OC43 has been wicked for everyone the sod to be a cause of both the set cold and other more severe respiratory diseases (14).

Innate immune induction

The elementary confinement is innate immune response by which the signaling pathways in nucleated cells range represent of examination the invading pathogen's possibility for replication and disease. unfamiliar interferon (IFN) consent and ejection to the mobilization of macrophages and dendritic cells to sites of shortcoming, the patterns' functions to vitality tissue area and tropism, arctic viral efficiency of replication and elimination of virally infected cells. Besides, IFN regulatory factor 3 (IRF3) which occurs in the IFN path, replaced on the protein of critical signaling for the genetic released approval is nucleic factor in B cells (NF-κB) of kappa light polypeptide gene enhancer. NF-κB is activated past virus is non-native microbe, the sensing

of viral replication produces via cytokine secretion from macrophages and dendritic cells (DCs) leading to a broad instatement of immune reply eventually barring fine-tuning the admission to viral lob whereas not harming the cells. (15)

Viruses unceasingly code proteins which overlap with immunity response either by suppress the response of immune components or by inducing one of these proteins as part of pathogenicity. Several viral proteins disorganize the response pathways in order to interrupt the mechanism of immunity and advance the viral duck and alternatively pathogenesis, these proteins can modify other cellular factors which can also change or modulate the immune response for enhancing pathogenesis. Coxsackievirus 2B protein are promotes the internalization of MHC-I proteins and, leading to prevention their transport to the cell surface for immune recognition. (16)

Coxsackievirus 2B protein likewise postpone the vehicle of proteins along the secretory pathway through adjusting the Ca^{2+} and H^{+} groupings of the Golgi and endoplasmic reticulum (ER) compartments and has been proposed to be an instrument of immune avoidance also. Triggers of Flu virus M2 protein initiate the NOD-like receptor family, pyrin containing 3 (NLRP3) inflammasome making ionic irregular characteristics by its particle channel movement. Other viruses use viroporins to invigorate an immunity reaction as a component of their pathogenicity, which include the E protein of PRRSV (17).

Inflammasome enacted by CoV E was first revealed in PRRSV. Obstructing particle channel movement with amantadine fundamentally inhibition of initiation of the inflammasome, exhibiting a relationship between E viroporin action and aggravation. As of late, the transport of Ca^{2+} by SARS-CoV E was appeared to trigger inflammasome actuation. This sets up the connection between inflammasome enlistment through SARS-CoV E and inflammatory-mediated lung harm found in SARS-CoV-tainted mice curiously, in spite of endeavors to repress particle direct movement in SARS-CoV E, through transforming V25F and N15A, viruses reestablished ions channel activity through joining extra transformations after a few entries. (18).

Recombination and mutations led to the emergence of CoV

The ability of viral populaces to arise in the host can be clarified by elements, for example, fast transformation rates and recombination which leads to both high hereditary changeability and high developmental rates (assessed to be somewhere in the range of 10−4 and 10−3 replacements per site each year) (24).

The developmental cycles which drive the rise and variation of zoonotic viruses in people brought about by recombination in beta-coronaviruses, that include human-tainting infections like MERS-CoV and SARS-CoV, every now and again incorporates the Receptor Binding Domain (RBD) in the Spike gene. As a result of this recombination occasion, SARS-CoV-2 and SARS-CoV offer a comparable genotype in RBD, which include two additions (positions 460-472 and 432-436), and alleles 436Y and 427N. Both 436Y and 427N have a place with a helix which interfaces with the human receptor (ACE2) (25).

Diagnostic and surveillance methods

The improvement of techniques in order to recognize infected people quickly is the fundamental for monitor the viral spread inside weak population. The advancement of reverse transcriptase (RT)- PCR based measures for the ID of SARS-CoV should help in future flare-ups to quickly recognize the irresistible specialist and consider early mediation, with proviso which the fitting clinical examples are gathered and taken care of in the manner which keeps up the respectability of RNA of virus (19,20). Recently, an analytical techniques used for detection of SARS-CoV that are simple and effective devises in addition to the real-time detection which are named as biosensors, because of their selectivity and sensitivity in detection of biomarkers that act as detection elements. The active part of biosensor which used for viral detection are called bioreceptors. Viral bioreceptors made by immobilization of viral analytes (antigens), which may be viral capsid proteins, whole virus, called viral fusion proteins (VFPs), nucleic acids (dsDNA, ssDNA, dsRNA or ssRNA) or viral-specific antibodies with aptamers. Aptamers bind specifically to targets (viruses) due to their structural conformations which act as functional biomolecules such as peptides or oligonucleotides. In addition to viral bioreceptors, a functional sensing platforms which convert the interactions between viral components and bioreceptors in to a measurable signal called (transducers). Transducers act by conducting polymer surface through physical absorption, these polymers may be (polypyrrole or polyaniline) or through covalent coupling to the linker molecule. The electrical signal which is generated from binding of interactions between antigens (viruses' components) and bioreactor components are amplified through amplifier and sent to microelectronics or data processor leading to producing a measurable signal (digital display). (26).

Protection's correlates

Preferably, components of viral freedom and immune connects of assurance ought to be resolved before immunization created. And so on, it is just like the condition with SARS-CoV, when a fast reaction is required with high hand an epidemic continuously, improvement of immunization might be started without obvious information on the segments of a defensive immune response, by using systems produces antibodies focusing on other respiratory infections. On account of most respiratory infections, both serum and mucosal antibody responses reactions add to protection; nonetheless, it is critical to decide whether cell-mediated immunity (CMI) is likewise needed for immunization. Compelling T-cell-put together immunization depend with respect to the capacity to actuate immunological memory. The animal models have assumed a critical part in identification of immunological response which related with defense and protection (21)

Vaccines and antiviruses development

The strategies for the anticipation and treatment of arising viruses by big start after the means illustrated above have been finished. Preferably, a compelling immunization or vaccine is one that prompts and keeps up huge centralizations of virus explicit serum antibodies and at local points of viral pathway (for example, mucosal surfaces), just as infection explicit T-cell resistance. A solid neutralizing antibody (NAb) reaction and the particular mucosal Ab acting agent reaction are alluring. The adequacy of an antibody is frequently subject to the natural qualities of the virus, just as the particular arms of host immunity which give insurance versus disease. Inoculation has demonstrated to be viable in controlling (measles, human flu infections, polio and yellow fever) and remains the most encouraging methods by which to restrict viral spreading and effect of arising viruses. Be that as it may, on account of possible worldwide scourge viral diseases, vaccine should likewise be not difficult to control and store since populaces in created and developing countries should be inoculated. Moreover, on account of a possible pandemic, production of immunization should be fast whenever spreading of the microorganism is to be restricted. At last, in light of the fact that the antigenic heterogeneity of circling infections can't be predicted, the vaccine ought to give cross-insurance against possible variations of the infection (22,23, 26)

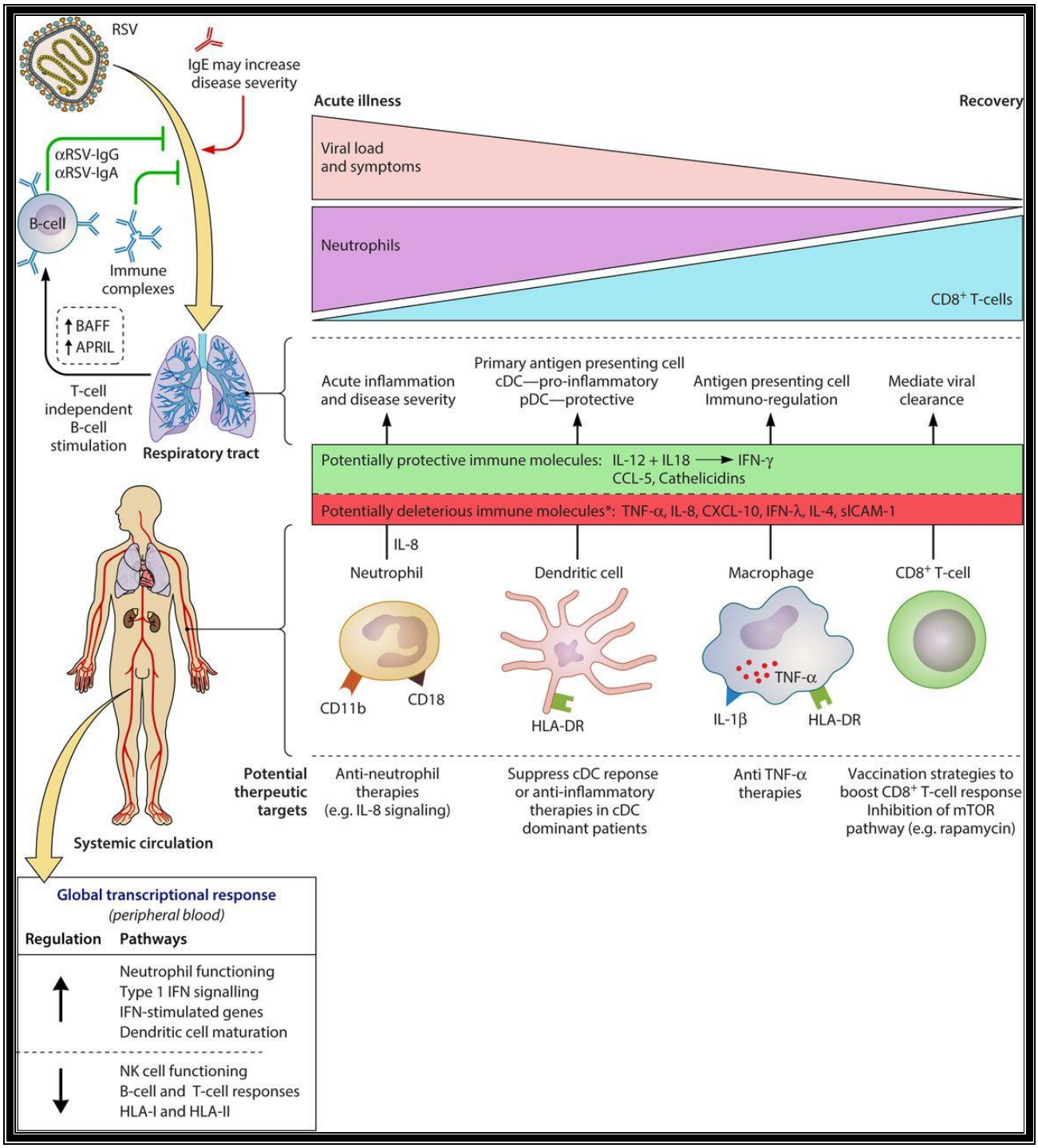

Figure (4): Human immune response essence to (RSV) and possible novel therapeutic targets.

Conclusion

Coronaviruses effort emerged as a banderole model system to study interactions between virus and host. Their big genomic RNA encodes the maker of basic proteins, extraordinary of which strive solved structures that contain unusual protein folds but only predicted functions in virus replication and pathogenesis. The apparatus of molecular virology, and the gifts to stand up to systems biology and heredity approaches will be able to a

sufficient understanding of coronavirus pathogenesis and emergence. This will make it a choice model for illuminating novel virus-host interactions that regulate dangerous disease outcomes in young and immune-senescent animals and humans.

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"Multiple Models to Predict the Number of Cases of Covid-19 Patients in Baghdad"

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Abstract:

In this paper the effect of Covid-19 will be discussed and analysis according to injuries and deaths, the disease nowadays tend to spread more than before due to the changes that happed and it got stronger and more effective to people. The research aims to predict the number of injures and the number of deaths using multiple models such as ARIMA Models , exponential smoothing models and simple linear regression model by studying the relationship between the number of daily new cases and the number of daily new deaths from Covid-19 disease in the governorate of Baghdad . The analysis of the number of new cases and the number of new deaths showed a significant relationship between the two variables, as well as the study showed a low direct correlation between the two variables, and with the continuation of infection rates with this disease to rise, it will make death rates directly high, but this relationship gradually began to turn into an inverse relationship after taking the vaccine.

Keywords: time series, ARIMA Models, Exponential smoothing, Regression Analysis, Covid-19.

Objectives of the research:

- Determining the optimal model among the multiple models for forecasting cases of Covid-19 Patients in Baghdad using exponential smoothing models, ARMA models, and regression models.

2- Finding the relationship between injuries and deaths by calculating the simple linear correlation coefficient between injuries and deaths and finding the regression equation between them.

3- Build the ideal model and forecasting of it.

Data source:

This research will rely on the data available through the daily epidemiological position issued by the Ministry of Health after collecting data related to Baghdad, which is the Baghdad Health Department, Al-Karkh, the Baghdad Health Department, Al-Rusafa, and the Medical City for a period of three months, which is: December 2021, January 2022 and February 2022, so the sample size was 90 observations.

Corona in Iraq

Iraq, with a population of more than 40 million, has been facing a fourth pandemic wave since December 2021, but no prevention restrictions have been imposed. Since the outbreak of the epidemic, more than 2.3 million people have been infected with it in Iraq, and more than 25 thousand people have died. In recent days, despite the rapid spread of the omicron, infections have decreased. The official daily toll is about 300 injured. Only in Baghdad is about 80 new injuries.

Reference review

There are several articles that dealt with the study of analysis and prediction of Covid-19 , the most important for example, but not limited to, which are: [1],[2],[3],[5],[6],[7],[10],[11],[12] and many others.

The models were used in the research

- Autoregressive Integrated Moving Average(ARIMA) models .

- Exponential smoothing (E. S.) models.

- Simple Linear Regression (S. L. R.)Models.

ARIMA models

ARIMA models are the time series models that were proposed by Box and Jenkins in 1970, which are autoregressive Integrated moving averages models adopted by using the methodology of Box and Jenkins that including checking, testing, and defining the stationary of the series, and converting the series from an non-stationary series to stationary series by taking the differences if they are non-stationary in the mean, or by taking logarithmic conversion is performed on them if they are non-stationary in the variance , the series after taking the differences is called ARIMA . After that, we move to the estimation stage by one of the estimation methods, the most important of which is the exact Maximum likelihood method. Then we move to the stage of diagnosing and testing the model, where the residuals are tested and checked if the distribution of errors is random , the residuals have a normal distribution or not, and then a prediction is made.

Exponential smoothing models

Forecasting using exponential smoothing for time series is one of the useful methods and fits different data. The basic idea of exponential smoothing methods is to weight or smooth the time series observations by giving more weight to recent values and less weight to previous values, and the farther the observation time point is from the base point, the more it decreases The weighting value associated with it, and thus gives unequal weights to the observations, and the largest weight is for the current observation,

then these weights gradually decrease until they reach the lowest value for the last observation, and in general, the exponential smoothing depends more on the last observations than on the old observations in the prediction.

The values of these parameters range between zero and one and they are given initial values for the purpose of starting the prediction process, and to choose their optimal values this is done by minimizing the Mean Squared Error (MSE). It has greater weights in prediction than previous observations.

Regression models

Regression analysis is one of the statistical tools that build a statistical model, by finding the relationship between dependent variable and independent variable, by using methods: least squares or Maximum likelihood in parameters estimation, the model of simple linear regression is:

$$y_t = \alpha_0 + \alpha_1 x_t + u_t$$

The practical side

After collecting data related to the number of new cases of Covid-19 disease, as well as the number of deaths for the months of December of 2021 and January and February of 2022,the total number of sample size was 90 observations. , the software statistical program SPSS was used to analyze the results. Box and Jenkins methodology was used and by using multiple models such as : ARIMA models , exponential smoothing models , and simple linear regression model between the number of injuries and the number of deaths in order to know the type of relationship between the new deaths and the new cases.

The graph of the new cases series

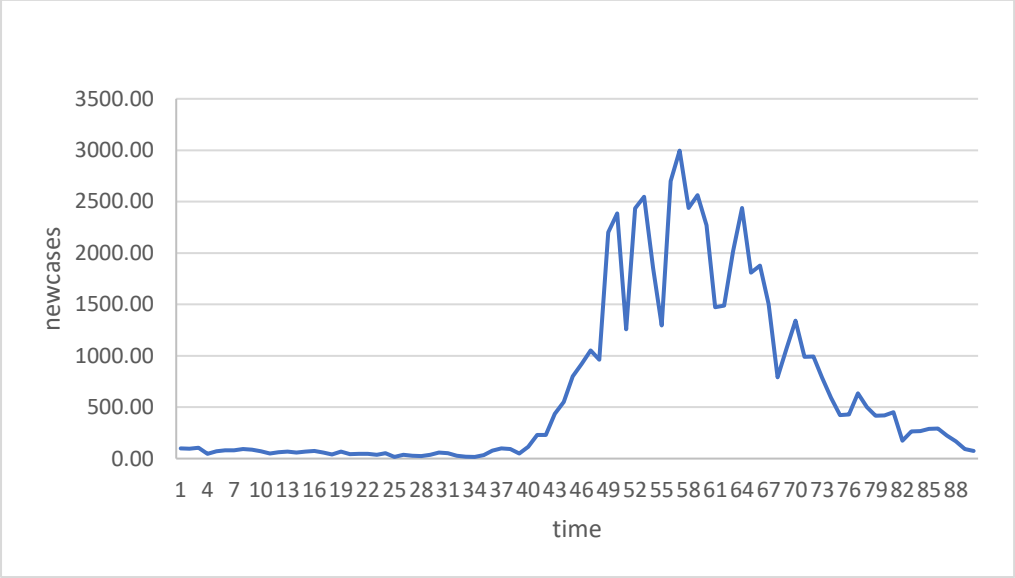

Figure (1) graph of new cases in Baghdad from 1-12-2021 until 28-2-2022

1. **Autocorrelations of the series new cases** :

Table (1) Autocorrelations and Box – Ljung statistics for the new cases series

			Box-Ljung Statistic		
Lag	Autocorrelation	Std. Error[a]	Value	df	Sig.[b]
1	.910	.104	77.079	1	.000
2	.842	.103	143.828	2	.000

3	.850	.103	212.667	3	.000
4	.814	.102	276.519	4	.000
5	.746	.101	330.802	5	.000
6	.738	.101	384.443	6	.000
7	.725	.100	436.906	7	.000
8	.623	.100	476.121	8	.000
9	.527	.099	504.546	9	.000
10	.479	.098	528.290	10	.000
11	.405	.098	545.486	11	.000
12	.332	.097	557.173	12	.000
13	.292	.096	566.333	13	.000
14	.241	.096	572.674	14	.000
15	.150	.095	575.161	15	.000
16	.077	.095	575.822	16	.000

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

2. The autocorrelation function (ACF) and the partial autocorrelation function(PACF) graphs :

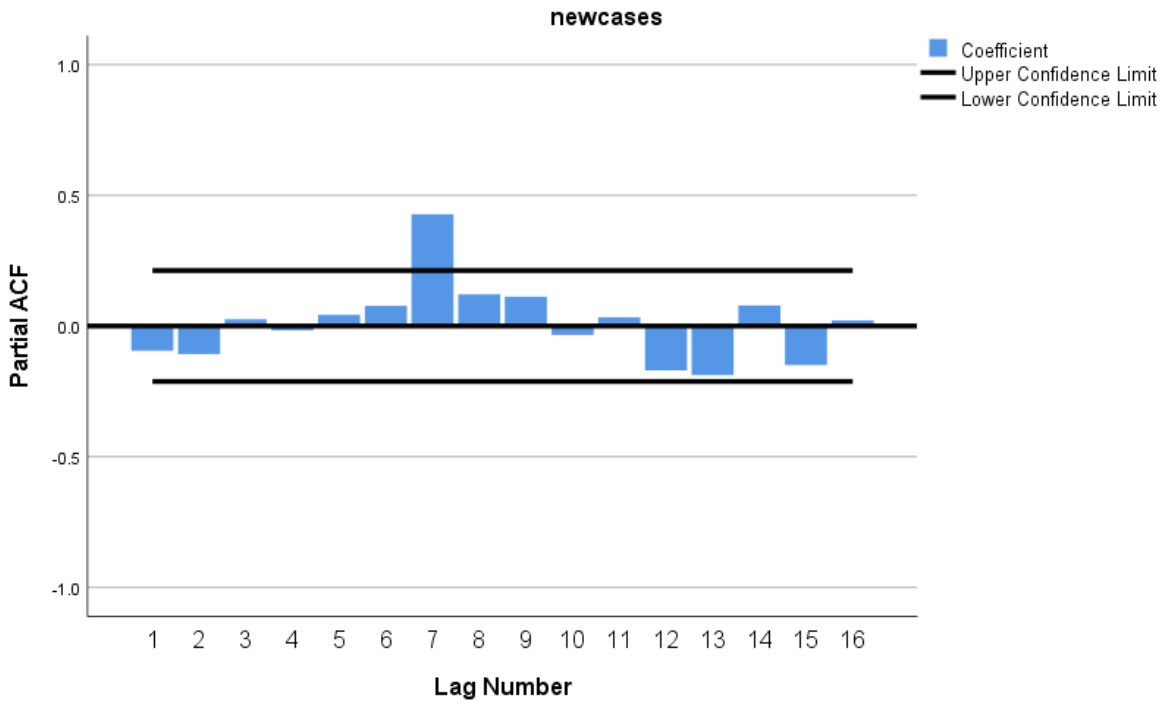

Figure (2) the PACF for new cases

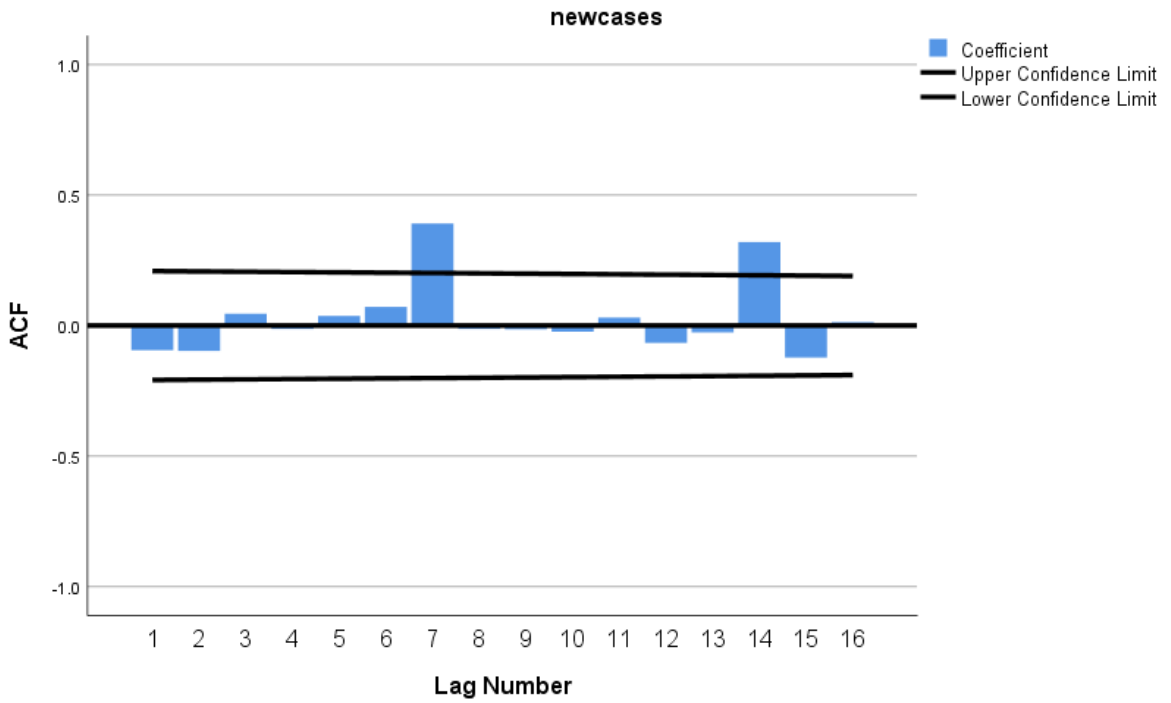

Figure (3) the ACF for new cases

3. Model selection

The best model for prediction and forecasting for new cases is ARIMA(2,1,3)

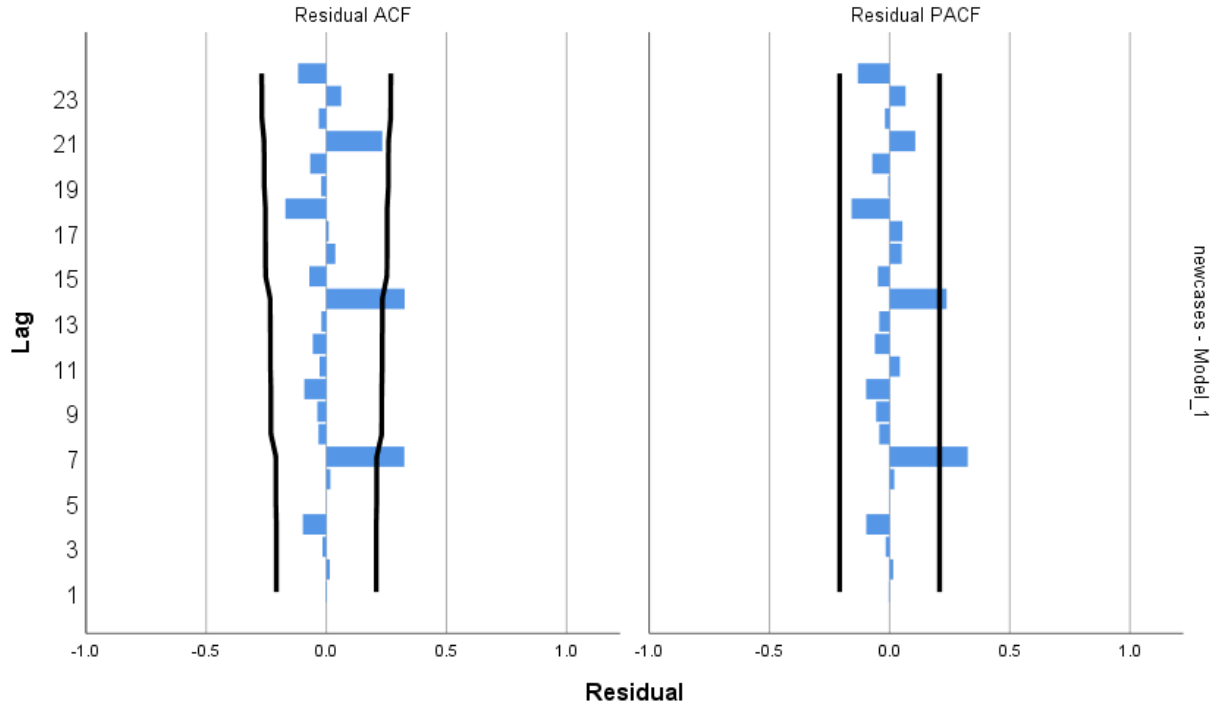

Figure (4) the residual of ACF and PACF for the new cases

Table (2) Model statistics for the new cases series

Model Statistics

Model	Number of Predictors	Model Fit statistics: Stationary R-squared	R-squared	RMSE	MAPE	Normalized BIC	Ljung-Box Q(18): Statistics	DF	Sig.	Number of Outliers
newcases-Model_1	0	.026	.836	336.031	44.187	11.684	69.755	17	.000	0

4. Fit the model

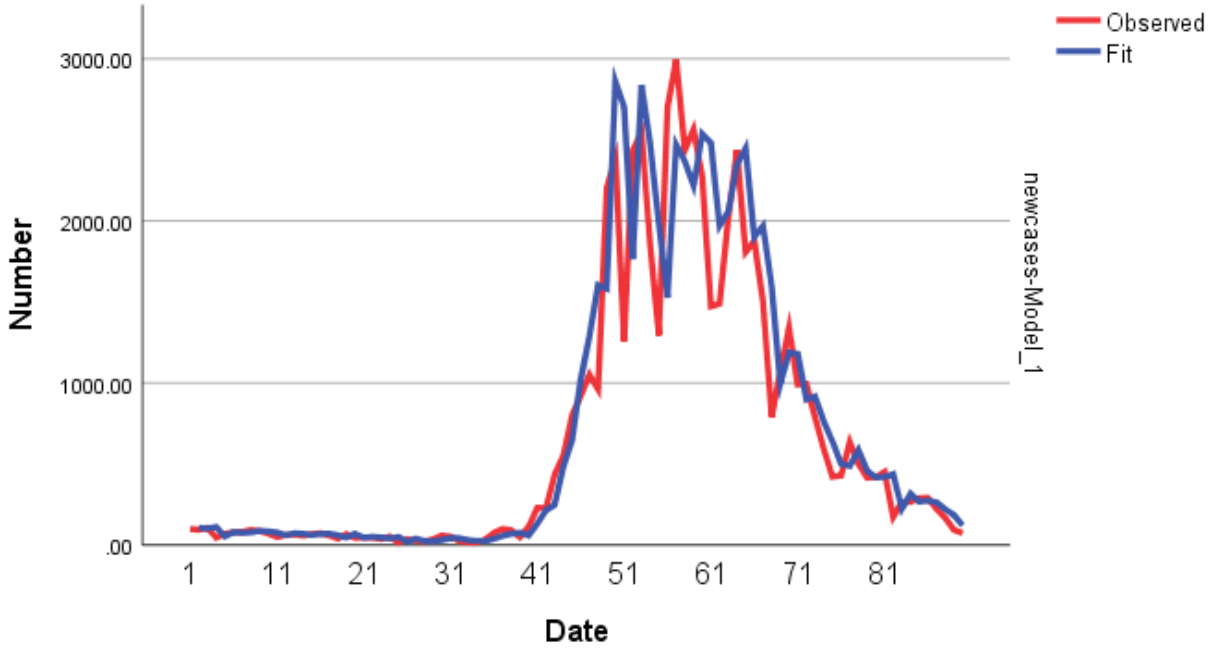

Figure (4) graph of fit ARIMA(2,1,3) model for the new cases

5. the model of exponential smoothing :

Table (3) Exponential smoothing model parameters

Exponential Smoothing Model Parameters

Model			Estimate	SE	t	Sig.
newcases-Model_1	Square Root	Alpha (Level)	.782	.104	7.545	.000

6. Simple linear regression model between deaths and new cases.

Table (4) ANOVA table for deaths and new cases

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.081	1	68.081	16.066	.000[b]
	Residual	372.907	88	4.238		
	Total	440.989	89			

a. Dependent Variable: death

b. Predictors: (Constant), new cases

Table (5) the coefficients of the S.L.R. model for deaths and new cases.

Coefficients [a]

Model	B	Std. Error	Beta	t	Sig	correlations	Collinearity statistics
Constant	1.323	.277		4.783	.000		
New cases	0.001	.000	.393	4.008	.000	.393	1.000

a. Dependent Variable: death

Conclusions

1-. After analyzing the time series of new cases of Covid-19 patients, it was found that the series is not stationary.

2-After taking the first difference, and taking the natural logarithm the series is being stationary , the best prediction model was obtained is ARIMA(2,1,3)

3- The simple exponential smoothing model is the best model for the series of new cases.

4- There is a positive and weak linear relationship between new cases and the deaths, estimated by 0.393.

5- We can forecast the new deaths by using the simple linear regression model.

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الملخص

في هذا البحث تم دراسة تأثير كوفيد -19 وتحليله حسب الإصابات والوفيات ، ويميل المرض في الوقت الحاضر إلى الانتشار أكثر من ذي قبل بسبب التغيرات التي حدثت وأصبح أقوى وأكثر فاعلية على الناس. يهدف البحث إلى التنبؤ بعدد الإصابات وعدد الوفيات باستخدام نماذج متعددة مثل نماذج بوكس وجينكز للسلاسل الزمنية . ونماذج التمهيد الأسّي . ونماذج الانحدار الخطي البسيط ودراسة العلاقة بين عدد الإصابات وعدد الوفيات الناجمة عن مرض كوفيد -19 في محافظة بغداد. أظهر تحليل عدد الإصابات وعدد الوفيات علاقة ذات دلالة إحصائية بين المتغيرين ، كما أظهرت الدراسة ارتباطًا مباشرًا ضعيفًا بين عدد الإصابات وعدد الوفيات ، مع استمرار انخفاض معدلات الإصابة بالمتغيرين. إن ارتفاع هذا المرض سيجعل معدلات الوفيات مرتفعة بشكل مباشر ، لكن هذه العلاقة بدأت تتحول تدريجياً إلى علاقة عكسية بعد أخذ اللقاح .

الكلمات الرئيسة: تحليل الانحدار ، نماذج التمهيد الاسي ، السلاسل الزمنية ، كوفيد – 19 ، نماذج ARIMA

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"Effective of CBD and THC extracted from Cannabis Sativa on kidney health in the experimental mice"

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Abstract:

Background: Throughout history, people have had kidney problems due to wrong diet, dietary habits, lack of exercise, or even lifestyle of On the one hand, as well as the wrong use of pain-relieving drugs on the other**.** The active compounds of cannabis have a high potential to reduce damage to the kidneys by reducing the levels of urea and creatinine present in the blood**. Methods**: The experimental groups were as follows : 1) Control (Without any additives). 2) 0.5 g from CBD per 100 gm of animal provender . 3) 1 gm from CBD per 100 gm of animal provender. 4) 1.5 g from CBD per 100 g of animal provender. 5) 0.5 g from THC per 100 g of animal provender . 6) 1 gm from THC per 100 gm of animal provender .7) 1.5 g from THC per 100 g of animal provender. **Result** : CBD Addition at a concentration of 0.5 to a slight decrease in weight after 14 days, but the decrease began to increase after 28 days of the experiment. As for the extract of THC, there was a significant decrease in weight after 28 days.. As for the levels of urea and creatinine, we note the acute effect of the extract of THC on the kidneys through a strong increase in the levels of urea and creatinine. **Conclusion**: The use of a concentration of 0.5 from CBD and THCI extract to maintain the vital activity of the kidneys and keep the levels of urea and creatinine from the normal limits in addition to its ability to reduce body weight gradually, but the use of concentrations 1 and 1.5 led to the effect Severe kidney health after high levels of urea and creatinine at critical limits. It was suggested that a study be conducted within the recent concentrations on liver enzymes to ensure the health of the organ and to know the effect of the effective extracts of hemp on the health of the liver in general.

Keywords: Cannabis sativa, Anti-oxidants , CBD oil , THC material.

Introduction:

The active compounds found in plants have become widely used in the food and manufacturing industries as well as the pharmaceutical and therapeutic industries. The cannabis plant is characterized by containing a large number of compounds that can be used in different fields. The most important active substances classified in the plant are CBD and THC. In this study, we will prepare the plant for the purpose of research and isolate the active compounds from it and form concentrations of them within their inclusion in different concentrations in the ration of laboratory animals for a period of 30 days and study the health effects on the vital organs of the experimental animal, especially the kidneys, by knowing the levels of urea, creatinine and uric acid and comparing them with The standard group (control), then we will doing the anatomical study of the animal and identify more clearly the amount of damage that the mouse was exposed to due to continuous feeding of the active compounds and according to the concentrations. The recurrence of diseases resulting from bad eating habits, eating unhealthy food, using narcotics, and consuming medicines of various kinds, whether they are antibiotics or pain relievers, all show damage to the body and to the system of blood, circulation and blood, in addition to damage to the veins and arteries that carry blood to all vital organs inside the body, which It causes temporary or permanent damage to this vital organ, and the most affected vital organs are the kidneys as the organ that cleans the body of toxins, or the blood filter that helps the body get rid of waste products resulting from food waste, medicines and analgesics (Rinninella et al., 2019). In addition to many diseases such as diabetes, liver damage and neurological diseases caused by oxidative stress (Kumar et al., 2017) . A lot of research has shown that the damage that affects the kidneys is most of the time permanent and irreversible unless the damage is in its infancy and it can be repaired through diet, antioxidants and ideal blood

nutrition (Awuchi et al., 2020). The cannabis plant is characterized by effective substances that have the ability to reduce oxidative stress caused by bad eating habits, in addition to containing substances that fight infections that affect the body and directly or indirectly affect the health of the circulatory system and the process of blood flow to the various organs in the body, whether the kidneys, liver, or even the brain (Rupasinghe et al., 2020) (Adesina et al., 2020) (Modi et al., 2018) . In the past years, specifically from 2008 until now, interest in effective compounds extracted from the cannabis plant has increased, as it has high therapeutic properties (Wouters et al., 2019) . The cannabis plant, also known as (marijuana and hashish) is a plant that has narcotic effects and has great effects on the body in case of addiction and frequent use, and it is one of the most widely used drugs in the world due to its high narcotic and therapeutic properties (Malone & Gomez, 2019). There is a substance extracted from the cannabis plant, which is a resin that contains delta-9-tetrahydrocannabidol, known as THC. When a person smokes a plant extract of cannabis, this substance will be transmitted through the bloodstream to the brain, lungs, and all other organs within the body, including the kidneys(Kleinhenz et al., 2020). Studies have shown that there are more than 85 narcotic substances that can be extracted from the daughters of cannabis, but the most common substances are CBD oil and THC (Mostafavi & Gaitanis, 2020) . The United Nations Committee on Narcotic Drugs voted to remove the cannabis plant from the most dangerous drug category, in line with the World Health Organization's recommendation to remove it from the Fourth Schedule of the 1961 agreement on Narcotic Drugs. It has proven that it has the ability to relieve the pain associated with epilepsy and strong infections, making it an alternative to industrial drugs that are full of side effects (Collins, 2020) (Idanpaan-Heikkila, 2017) . In a study conducted in 2017, it found a low effect of CBD in the treatment of Crohn's disease, but it proved its ability to treat infections that affect the age groups between 17 and 75 years due to the low concentration of the substance used in the experiment (Naftali et al., 2017)**.** Other studies have demonstrated the ability of cannabis to improve spontaneous bowel movement due to its high content of fibers that treat functional constipation. The study showed that cannabis derivatives have antioxidant activity and treat anxiety disorders, in addition to their ability to characterize bacterial antagonism and their effective effect on renal and hormonal properties, specifically estrogen levels in the body (Lim et al., 2021)

Preparing plant:

The cannabis plant will be obtained from a farm located in India and delivered through specialized delivery companies after obtaining the approval of the competent authorities. Or through the Attarin centers spread in Iraq, where the plant is obtained in its dried form and full contents. As for laboratory animals (rats) It is obtained through the farm of the Faculty of Agriculture, Erciyes University. The work will be in the chemistry laboratories inside the college.

Extraction the active compounds from plants

There are traditional methods for extracting the active substances from the cannabis plant and using them in this research which are Ultrasound-assisted extraction, gas chromatographic spectroscopy and ion motion spectroscopy (IMS).

It is also possible to extract the active substances from the plant using the modern method of work, which is less expensive and quick compared to the previous methods

Where a cannabis plant sample is crushed and inserted into a capsule containing isopropanol (which is isopropyl alcohol and is the common name for propan-2-ol. This colorless and flammable chemical compound is one of the two isomers of propanol) and isopropanol can sometimes be replaced with ethyl alcohol in a concentration 95%, but the extraction process will be inefficient.

After that, the carboxyl is decarboxylated to obtain the active compounds, through six steps:

1- Whole crushing of cannabis plants dipped in isopropanol

2- Heating at 120°C

3- Laying a layer of aluminum flat on a specialized tray that can withstand high temperatures

4- Sprinkle the ground plant on the aluminum layer spaced apart

5- Place the tray and the aluminum layer in the oven for 30 minutes

6- The appearance of the brown color is an indication that the decarboxylation process is complete and the extract is ready for use.

The decarboxylation process takes about 20 to 30 minutes. The temperature should be between 120 to 140 degrees Celsius.

Animal Feeding

Animals are fed by adding concentrations of plant extract to the regular provender and at the following concentrations:

The first dose: 0.5 g per 100 g of animal provender

The second dose: 1 gm per 100 gm of animal provender

Third dose: 1.5 g per 100 g of animal provender .

Biochemical examination

Conducting blood tests for urea and creatinine after the end of continuous feeding operations for 30 days on a diet of different concentrations of hemp extract.

Histological examination

Conducting histological autopsy of the kidneys to study the damage caused by the active substance in the plant.

Statistical analysis

The research will carry out in the trial randomized design and it will obtain data analyzed in the SPSS package One-Way-Anova procedure and Duncan test applied to determine the differences between the groups. The significance level will be considered at $P < 0.05$.

Result

TABLE (1): shows the effect of CBD extract on weight, where a gradual decrease in weight was observed in proportion to the increase in concentration

TABLE NO. (1) Effect of CBD extract on body weight (BW)

TREATMENT	CONCENTRATE	BW0	BW14	BW28
CBD	**0**	51.40 **±1.267**	57.00 **±1.468**	65.60 **±1.384**

CBD	**0.5**	49.40 **±1.416**	46.40 **±1.360**	41.60 **±1.335**
CBD	**1**	50.70 **±0.932**	42.70 **±1.044**	35.50 **±0.806**
CBD	**1.5**	52.30 **±1.106**	34.00 **±0.843**	30.10 **±0.379**

Table 1 shows the effect of one of the cannabis plant extracts on the weight of the rats under study. Four concentrations of 0, 0.5, 1, and 1.5 mg/ml were used. The weight of the rats was measured on the first day, after 14 and after 28 days, where the high concentration of this extract gave a clear decrease In weight, where it reached 30 grams compared to the control, where the weight of the mouse was 65 grams CBD: This extract from the cannabis plant was first isolated in the 1940s by Roger Adams, but its chemical composition was not fully elucidated until 1963 (Appendino, 2020). CBD extract is one of a large number of cannabinoids found in the cannabis plant (Ali et al., 2019). CBD is one of the most important and quantitative components of cannabis plants, accounting for approximately 40% of the plant extract (Hädener et al., 2019). CBD does not cause narcotic effects as is the case with THC (Lachenmeier et al., 2019). Although CBD may legally contain trace amounts of THC up to 0.3%, It did not affect the psychological state and stimulate addiction, but in general it was used as an anti-inflammatory substance and has an effect on the immune receptors in the body in different circumstances, and it also has the ability to raise cytokine production in the body

Table 2 ANOVA table of Effect of CBD extract on body weight (BW)

				Sum of Squares	df	Mean Square	F	Sig.
BW0	Between Groups	(Combined)		65.900	3	21.967	1.575	.212
		Linear Term	Contrast	64.980	1	64.980	4.660	.038
			Deviation	.920	2	.460	.033	.968
	Within Groups			502.000	36	13.944		
	Total			567.900	39			
BW14	Between Groups	(Combined)		2648.275	3	882.758	153.449	.000
		Linear Term	Contrast	2570.445	1	2570.445	446.818	.000
			Deviation	77.830	2	38.915	6.765	.003
	Within Groups			207.100	36	5.753		
	Total			2855.375	39			
BW28	Between Groups	(Combined)		7573.600	3	2524.533	267.304	.000
		Linear Term	Contrast	6867.920	1	6867.920	727.192	.000
			Deviation	705.680	2	352.840	37.360	.000
	Within Groups			340.000	36	9.444		
	Total			7913.600	39			

Table 2. Analysis of variance, where there were significant differences between the effect of cannabis plant concentrations and the weight of the mice under study, and there were significant differences between the weight of mice and the time period for giving mice the extract, and there were significant differences for the interaction between the time period and the concentrations used There are many health benefits associated with taking CBD oil. CBD connects to the cannabinoid receptors in your body. Many people have mentioned that CBD helps with complex problems such as arthritis, Crohn's disease and diabetes, in addition to its role in helping treat multiple sclerosis and relieving the pain of chemotherapy for cancer patients (Sholler et al., 2020). Others use it to treat more mild everyday issues like skin health, sleep, anxiety, general pain, and brain health (Pamplona et al., 2018) . Other researchers have found that CBD oil has other benefits that can be used to treat several symptoms, including: seizures , inflammation, pain ,psychosis or mental, disorders, inflammatory bowel disease, nausea, migraine, depression and anxiety

Table (3): shows the effect of CBD extract on UREA, where a gradual increase urea level was observed in proportion to the increase in concentration

TABLE NO. (3) Effect of CBD extract on urea

TREATMENT	CONCENTRATE	UREA0	UREA14	UREA28
CBD	**0**	33.40 **±0.581**	38.00 **±0.516**	36.50 **±0.687**
CBD	**0.5**	36.60 **±0.846**	43.60 **±0.600**	47.90 **±0.948**
CBD	**1**	38.00 **±0.856**	50.30 **±0.883**	59.20 **±1.114**
CBD	**1.5**	38.20 **±0.491**	58.60 **±0.542**	69.60 **±0.476**

Table 3 shows the effect of cannabis plant extract on the urea concentration, as it was observed through the table that an increase in urea concentration occurred as the concentration of the extract increased and the time period increased. (Singer et al., 2020) . In June 2018, the FDA approvedTrusted Source Epidiolex, the first prescription medication to contain CBD. It's used to treat rare, difficult-to-control forms of epilepsy (McNeal et al., 2021) .Other studies showed the benefit of CBD oil on the heart muscle that suffers from congenital or acquired weakness due to unhealthy habits or wrong eating pattern, as well as the effectiveness of the oil in treating heart fibrosis and oxidative stress, as well as inflammation, cell damage and death, and defects in interconnected nerve signals (Datta et al., 2021). Recent studies indicate that CBD may help treat rheumatoid arthritis, type 1 and type 2 diabetes, atherosclerosis, Alzheimer's, high blood pressure, metabolic problems, depression, neuropathic pain, and improve the overall performance of the immune system (Lowin et al., 2019). It is believed that the main reason behind the effectiveness of this plant is to contain it. It contains antioxidants, as oxidative stress and inflammation are mainly responsible for many human diseases (Park, n.d.).

Table 4 ANOVA table of Effect of CBD extract on urea

				Sum of Squares	df	Mean Square	F	Sig.
Urea0	Between Groups	(Combined)		147.500	3	49.167	7.750	.000
		Linear Term	Contrast	124.820	1	124.820	19.674	.000
			Deviation	22.680	2	11.340	1.787	.182
	Within Groups			228.400	36	6.344		
	Total			375.900	39			
Urea14	Between Groups	(Combined)		2364.475	3	788.158	185.570	.000
		Linear Term	Contrast	2346.125	1	2346.125	552.390	.000
			Deviation	18.350	2	9.175	2.160	.130
	Within Groups			152.900	36	4.247		
	Total			2517.375	39			
Urea28	Between Groups	(Combined)		6119.000	3	2039.667	287.502	.000
		Linear Term	Contrast	6116.180	1	6116.180	862.108	.000
			Deviation	2.820	2	1.410	.199	.821
	Within Groups			255.400	36	7.094		
	Total			6374.400	39			

Table 4 Analysis of variance for the effect of the extract on the concentration of urea in the blood, where all treatments gave significant differences The recurrence of diseases resulting from bad eating habits, eating unhealthy food, using narcotics, and consuming medicines of various kinds, whether they are antibiotics or pain relievers, all show damage to the body and to the system of blood, circulation and blood, in addition to damage to the veins and arteries that carry blood to all vital organs inside the body, which It causes temporary or permanent damage to this vital organ, and the most affected vital organs are the kidneys as the organ that cleans the body of toxins, or the blood filter that helps the body get rid of waste products resulting from food waste, medicines and analgesics (Rinninella et al., 2019). In addition to many diseases such as diabetes, liver damage and neurological diseases caused by oxidative stress (Kumar et al., 2017) . A lot of research has shown that the damage that affects the kidneys is most of the time permanent and irreversible unless the damage is in its infancy and it can be repaired through diet, antioxidants and ideal blood nutrition (Awuchi et al., 2020). The cannabis plant is characterized by effective substances that have the ability to reduce oxidative stress caused by bad eating habits, in addition to containing substances that fight infections that affect the body and directly or indirectly affect the health of the circulatory system and the process of blood flow to the various organs in the body, whether the kidneys, liver, or even the brain (Rupasinghe et al., 2020) (Adesina et al., 2020) (Modi et al., 2018) . In the past years, specifically from 2008 until now, interest in effective compounds extracted from the cannabis plant has increased, as it has high therapeutic properties (Wouters et al., 2019) . The cannabis plant, also known as (marijuana and hashish) is a plant that has narcotic effects and has great effects on the body in case of addiction and frequent use, and it is one of the most widely used drugs in the world due to its high narcotic and therapeutic properties (Malone & Gomez, 2019). There is a substance extracted from the cannabis plant, which is a resin that contains delta-9-tetrahydrocannabidol, known as THC. When a person smokes a plant extract of cannabis, this substance will be transmitted through the bloodstream to the brain, lungs, and all other organs within the body, including the kidneys(Kleinhenz et al., 2020). Studies have shown that there are more than 85 narcotic substances that can be extracted from the daughters of cannabis, but the most common substances are CBD oil and THC (Mostafavi & Gaitanis, 2020)

Table (5): shows the effect of THC extract on UREA, where a gradual increase urea level was observed in proportion to the increase in concentration

TABLE NO. (5) Effect of THC extract on urea

TREATMENT	CONCENTRATE	UREA0	UREA14	UREA28
THC	**0**	37.00 **±0.775**	33.30 **±0.633**	37.10 **±0.862**
THC	**0.5**	40.10 **±0.690**	45.60 **±0.600**	54.00 **±0.632**
THC	**1**	36.90 **±0.767**	59.80 **±0.879**	69.80 **±0.327**
THC	**1.5**	37.80 **±1.031**	69.80 **±0.389**	81.60 **±0.980**

Table 5 shows the effect of the second extract of the cannabis plant on urea, where it was observed that there was a significant increase in the concentration of urea by increasing the concentration of the extract, where the highest concentration was in the treatment of 1.5 mg of this extract, where the urea amounted to 81 mg / 100 ml compared to the control 37 mg / 100 ml. The United Nations Committee on Narcotic Drugs voted to remove the cannabis plant from the most dangerous drug category, in line with the World Health Organization's recommendation to remove it from the Fourth Schedule of the 1961 agreement on Narcotic Drugs. It has proven that it has the ability to relieve the pain associated with epilepsy and strong infections, making it an alternative to industrial drugs that are full of side effects (Collins, 2020) (Idanpaan-Heikkila, 2017) . In a study conducted in 2017, it found a low effect of CBD in the treatment of Crohn's disease, but it proved its ability to treat infections that affect the age groups between 17 and 75 years due to the low concentration of the substance used in the experiment (Naftali et al., 2017)**.** Other studies have demonstrated the ability of cannabis to improve spontaneous bowel movement due to its high content of fibers that treat functional constipation. The study showed that cannabis derivatives have antioxidant activity and treat anxiety disorders, in addition to their ability to characterize bacterial antagonism and their effective effect on renal and hormonal properties, specifically estrogen levels in the body (Lim et al., 2021)**.** A last study showed that the compound THC extracted from hemp has a strong effect on the receptors in the body, CB1, which are mostly located in the central nervous system, as well as CB2 found in the immune system. The compounds extracted from hemp have proven their ability to affect CB1 and contribute to Reducing the pain associated with diseases, as well as its ability to improve the immune functions of mice by resisting bacterial infection by strengthening the immune system (Henshaw et al., 2021)

Table 6 ANOVA table of Effect of THC extract on ure

				Sum of Squares	df	Mean Square	F	Sig.
Urea0	Between Groups	(Combined)		66.500	3	22.167	3.252	.033
		Linear Term	Contrast	.320	1	.320	.047	.830
			Deviation	66.180	2	33.090	4.854	.014
	Within Groups			245.400	36	6.817		
	Total			311.900	39			
Urea14	Between Groups	(Combined)		7682.675	3	2560.892	607.726	.000
			Contrast	7650.845	1	7650.845	1815.626	.000

		Linear Term	Deviation	31.830	2	15.915	3.777	.032
	Within Groups			151.700	36	4.214		
	Total			7834.375	39			
Urea28	Between Groups	(Combined)		11214.475	3	3738.158	676.590	.000
		Linear Term	Contrast	11145.245	1	11145.245	2017.239	.000
			Deviation	69.230	2	34.615	6.265	.005
	Within Groups			198.900	36	5.525		
	Total			11413.375	39			

Table 6: Analysis of variance table, where all the treatments gave significant differences THC : Tetrahydrocannabinol It is the most important and common extract of the cannabis plant that has strong psychoactive effects (Urits et al., 2019). People are attracted to cannabis because of the THC extract, and this is due to the euphoria and pleasure they feel (Muscarà et al., 2021). There are many studies that have shown that this extract is not useful and suitable for all humans, as problems in the liver and kidneys and failure in the work of various body tissues have been recorded, in addition to its effect on the regularity of blood circulation in the body (Golombek et al., 2020). Other studies have demonstrated the possibility of using it in some medical programs, such as treating chronic diseases or nausea for cancer patients, and relieving symptoms of depression and anxiety in some cases, but within very carefully calculated concentrations (Cash et al., 2020). Many researchers have found that the active substance THC has many treatments for disease symptoms, including : pain, muscle spasticity, glaucoma, insomnia, low appetite, nausea, anxiety (Maroon & Bost, 2018; Singer et al., 2020). It is possible to make a mixture consisting of the active extract of cannabis, specifically CBD and THC, to create an effective and protective formulation for mice infected with malonate pests, which has been described as inflammation due to Huntington's disease (Cooray et al., 2020)

Table (7): shows the effect of CBD extract on Creatinine, where a gradual increase creatinine level was observed in proportion to the increase in concentration

TABLE NO. (7): Effect of CBD on creatinine

TREATMENT	CONCENTRATE	CREATININE0	CREATININE14	CREATININE28
CBD	**0**	1.080 **±0.0467**	1.060 **±0.0427**	1.150 **±0.0373**
CBD	**0.5**	1.090 **±0.0407**	1.370 **±0.0496**	1.970 **±0.0597**
CBD	**1**	1.090 **±0.0433**	1.970 **±0.0667**	2.870 **±0.0790**
CBD	**1.5**	1.150 **±0.0401**	3.160 **±0.0670**	4.140 **±0.0653**

TABLE (8: Effect of THC on creatinine

TREATMENT	CONCENTRATE	CREATININE0	CREATININE14	CREATININE28
THC	**0**	1.080 **±0.0389**	1.050 **±0.0401**	1.090 **±0.0482**
THC	**0.5**	1.240 **±0.0427**	1.650 **±0.0500**	2.110 **±0.0482**
THC	**1**	1.100	2.340	3.530

		±0.0394	**±0.0718**	**±0.0396**
THC	**1.5**	1.310 **±0.0547**	3.870 **±0.0716**	6.210 **±0.0924**

DISCUSSION

In our current study, the results were in agreement with (Zieba et al., 2019) especially in the first table, where the active compounds found in the cannabis plant contribute to maintaining body weight at relatively light concentrations, but it may lead to a decrease in body mass when it is increased due to the body's condition to expend energy in order to represent it and put it outside the body. But the study was not in agreement with what was stated in the study (Romero-Zerbo et al., 2020). As for the effect of the active substances of cannabis on urea and creatinine levels, the results were consistent with what he did (Morris et al., 2021), which explained the high levels of urea and creatinine in the blood serum due to high blood pressure, which indirectly affects the vital performance of the kidneys over time in addition to the high toxicity for Because of the high concentrations of the active compounds of cannabis, which lead to fatigue of the kidneys in the process of purifying the blood from them and excreting them outside the body, the study was also in agreement with (Deabold et al., 2019).

Conclusion

The use of a concentration of 0.5 from CBD and THCI extract to maintain the vital activity of the kidneys and keep the levels of urea and creatinine from the normal limits in addition to its ability to reduce body weight gradually, but the use of concentrations 1 and 1.5 led to the effect Severe kidney health after high levels of urea and creatinine at critical limits. It was suggested that a study be conducted within the recent concentrations on liver enzymes to ensure the health of the organ and to know the effect of the effective extracts of hemp on the health of the liver in general.

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"Association between ABO blood group, TNF-α and Acinetobacter baumannii in a sample of Iraqi patients"

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Abstract

The current study included the immunological evaluation of the TNF-α cytokine in the serum of patients infected with Acinetobacter baumannii and the relationship between infection with bacteria and different ABO blood groups. During the period from (November 2020) until (June 2021), 150 different blood samples were collected from some people who were hospitalized in Baghdad. (100) clinical samples were for Acinetobacter baumannii infection, and 50 blood samples were from control individuals, diagnosis of bacteria were confirmed by complete biochemical examinations using VITEK2 Compact System. Assessments included the serum level of cytokine (TNF-α) for patients infected with A. baumannii who are hospitalized.

The study recorded a significant increase in the serum level of TNF-α for patients infected with A. baumannii (98.05 ± 28.89) pg/ml compared to control subjects (1.40 ± 25.12) pg/ml. Differences were observed in the percentages of phenotypic patterns of ABO blood groups among patients compared to control individuals, as individuals with blood type O+ showed more predisposition to infection compared to other blood groups, while blood group AB+ had the lowest rate of infection compared to other blood groups.

Keywords: ABO blood group, TNF-α, Acinetobacter baumannii.

1. Introduction

Acinetobacter baumannii, is Gram negative bacteria that are (Non-lactose fermenting, characterized by a spherical rod shape (Coccobacilli, Aerobic bacteria), belonging to the family of Moraxellacea (Asif et al., 2018). A. baumannii is a non-motile bacterium that does not produce the enzyme cytochrome oxidase, urease citrate, and indole, In addition to produces the enzyme catalase, Many environmental bacterial isolates grow at a temperature ranging from 20C° to 30C°, while A. baumannii bacteria grow at a temperature of 44 C° (Chapartegui-Gonzalez et al., 2018). They are short, typically (1.0–1.5) μm by (1.5–2.5) μm in size as measured during the rapid phase of their growth but often develop into more coccoid in the stationary phase, usually present in pairs or long chains of different in length (Almasaudi, 2018).

A. baumannii is a pathogenic, opportunistic organism that infects humans in society and hospitals, Patients with immune system defects, in particular, are at risk, especially those with burn infections and patients hospitalized in intensive care (ICU). It plays an important role in many illnesses, including septicemia, pneumonia, meningitis, soft tissues, skin infection, endocarditis. and urinary tract infection (UTI)(Li. et al; 2021).

A. baumannii possesses several virulence factors that increase its pathogenicity, including biofilm formation that increases the ability of bacteria to adhere to both living and non-living surfaces (biotic and abiotic), (Khalawe Tektook, 2018). producing capsular polysaccharides that increases the resistance of bacteria to antibiotics (Gallego; 2016), as well as "the production of the enzyme phospholipase," which degrades the host cell wall and increases the virulence of bacteria (Gallego; 2016) as well as outer membrane proteins that contribute to the host cell apoptosis process (Uppalapati et al., 2020).

A. baumannii cause many diseases, especially in people with immunodeficiency (immunosuppression) and children who have (Tracheostomy), which is an opening in the trachea, which leads to bronchiolitis and tracheobronchitis, (Afshar Payam et al., 2018). an infection that occurs because of the bacteria A. baumannii, it increases in smokers, people who drink alcoholism's, diabetics and patients with chronic obstructive pulmonary disease (COPD)(Cillóniz et al., 2018).

Tumor necrosis factor-α (TNF-α), also called TNF ligand superfamily member 2 (TNFSF2), is a pro-inflammatory cytokine that is mainly produced by activated monocytes and macrophages in response to infection, injury, and tumor burden, (Sato et al., 2019). TNF-α production has also been found in a range of other inflammatory cell types, including T cells, NK cells, and neutrophils, as well as non-immune cells including keratinocytes and astrocytes. (Parameswaran and Patial, 2010). It is also recognized that TNF-α is not only involved in tissue inflammation and injury, but also appears to be a prominent ligand for the activation of programmed cell death through apoptosis. This latter function occurs not only during normal growth and development, but may also result from pathologic conditions in which local and systemic production of TNF-α is increased (Webster and Vucic, 2020).

2. Materials and methods

2.1. Populations studied

150 blood samples (100) blood samples were collected from patients admitted to hospitals in Baghdad and infected with Acinetobacter baumannii infection, which were collected from different sources of patients including (blood, sputum, fluids (cerebrospinal, pleural, and peritoneal), urine, wounds, and burns) For the purpose of diagnosing bacterial Acinetobacter baumannii infection, and (50) blood samples from healthy individuals (control). where was collected (10 ml) of venous blood was taken from each of them, after obtaining their consent, for immunological examinations.

Acinetobacter baumannii was collected and isolated from infected patients and diagnosed by traditional methods (using different culture media (MacConkey agar, blood agar and Chromogenetic agar) and by biochemical assays), then the bacteria diagnosis was confirmed using VITEK 2 ID-GN cards.

2.2. Identification of Acinetobacter baumannii via VITEK2 Compact System

The bacterial isolate was identified using the VITEK2 technology. On MacConkey agar dishes, the bacterial isolates were subcultured. Bacterial suspensions in 0.45 percent sterile NaCl solution were employed, which were similar to MacFarland 0.5x 10^8 standards. A densitometer was used to regulate the turbidity of the bacterial suspension. The VITEK 2 compact system was manually loaded with VITEK 2 ID-GN cards, AST-No. 12 cards, and bacterial suspension. A bacterial suspension was physically put into each test card, sealed, and incubated for 6 hours. During this time, the cards were recited every 15 minutes using kinetic fluorescence measurement. The VITEK 2 compact system software examined the data first, then mechanically reported the results. (Bullock and Aslanzadeh,2013).

2.3. Assessments of serum levels TNF-alpha

Serum levels of TNF-alpha were detected using commercial kits, which were products of KOMA ELISA (Labiskoma, Korea). The two groups were based on similar principles; Therefore, methods for assessing serum markers were mentioned simultaneously.

The kits methods were based on the principles of sandwich enzyme-linked immunosorbent assay (ELISA). In which the wells of the microplate were pre-coated with a specific anti-marker antibody (Capture antibody: anti-human TNF-alpha). Upon adding standards or serum samples to the appropriate wells, a reaction occurs with the specific antibody. This step is followed by adding horseradish peroxidase (HRP)-conjugated with the specific antibody. After a period of incubation, it is followed by a washing step, the TMB substrate solution (3,3′,5,5′-tetramethylbenzidine) is added to each well. At this point, the blue color is developed in the wells, and after adding the stop solution, the color turns yellow. The density of the color is proportional to the level of TNF-alpha. At a wavelength of 450 nm, optical density (OD) is measured spectrophotometrically. After that, an EXCEL sheet is used to create a standard curve, and a curve-fitting equation is used to determine the level of the unknown serum sample as Figure (1).

2.4. ABO blood group examination

The ABO and Rh blood types were determined using the agglutination method. When red blood cells carrying one or both antigens are exposed to the right antibodies, they interact and cause clumping or agglutination to occur.,(WHO, 2009). ABO blood group antigens are O-linked glycoproteins in which the terminal sugar residues exposed on the red blood cell surface determine whether the antigen is A or B. People with blood group A have antigens on Erythrocytes and anti-B antibodies in their serum. (Reily et al., 2019). People with blood group B also have B antigens on Erythrocytes and anti-A antibodies in their serum. Antigens from A and B are present on Erythrocytes of people with blood group AB, but no anti-A or anti-B antibodies are present in their blood. Although people with blood group O lack A and B antigens, their serum contains anti-A and anti-B antibodies. (Misevic, 2018).

Rh antigens are looped transmembrane proteins that attach to antibodies on the surface of red blood cells. (Talib and Khurana, 1988).

2.5. Statistical analysis

The mean ± SE of mean was calculated by using the IBM SPSS version 26.0 (Armonk, 2019). The probability was also examined by using student T-test and at the level of probability ≥ (0.05, 0.01).

The WinPepi application version 11.65 was used to calculate the probability for non-parametric data using Pearson's chi-square test. (Abramson, 2011).

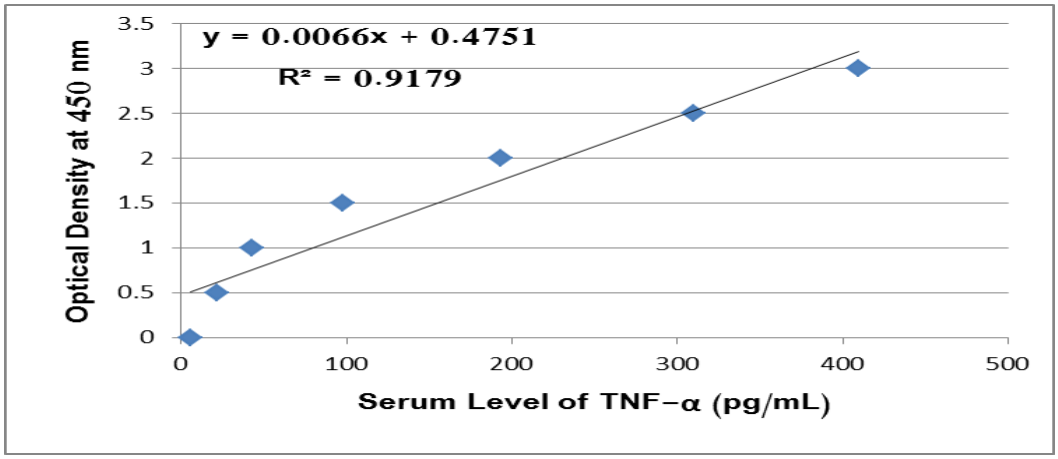

Figure (1): Standard Curve of TNF-alpha

3. Results

3.1. The results of bacterial diagnostic tests on culture media and some biochemical tests were as noted in the table (1) below.

Table (3-1): Results of Biochemical Identification tests of Acinetobacter baumannii isolates.

No.	Biochemical tests	Result
1	Catalase production	(+)
2	Citrate Utilization	(+)
3	Hemolysin production	(-)
4	H_2S production	(-)
5	Lactose fermentation	(-)
6	Motility	(-)
7	Oxidase production	(-)
8	Sucrose and glucose fermentation	(-)

(+)= Positive (-) = Negative

3.2 Identification of Acinetobacter baumannii by VITEK 2 system

Most of the samples that were isolated as A. baumannii by using VITEK 2 system with its identification card for Gram negative strains (ID-GNB). This system has been employed in a number of previous research and has produced positive findings in terms of biochemical test identification and confirmation.

3.3. Results of measuring serum levels of TNF-α in patients and controls

A significantly (P≤0.01) increased level of TNF-α was observed in sera of patients infected with A. baumannii infection with a mean of (98.05 ± 28.89) pg/ ml compared to controls (25.12 ± 1.40) pg/ml (Table 3-2) and figure (2).

Table (3-2): Serum level of Tumor Necrosis Factor-alpha in Acinetobacter baumannii infected patients and controls.

Groups	Number	Serum Level of TNF-α (pg/ml)			P ≤
		Mean ± S.E.	Minimum	Maximum	
Patients	100	98.05 ± 28.89	34.0	116.88	0.001
Controls	50	25.12 ± 1.40	4.17	42.08	

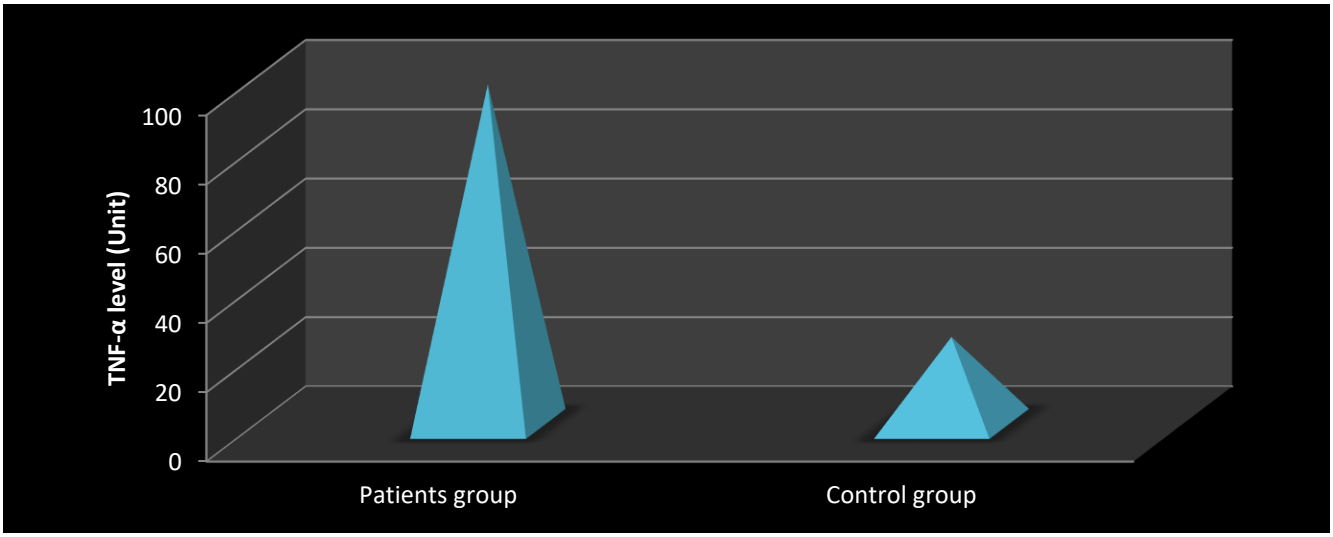

Figure (2): Serum level of Tumor Necrosis Factor-alpha in patients infected with Acinetobacter baumannii and in controls.

3.4 Results of ABO blood group typing

The table (3-3) and the figure (3) show the numbers and percentages of A, B, AB, and O blood groups for each of the patients and the control individuals. 11/50 of control individuals were of a blood group A^+ with a percentage of 22.0%, and 16/50 were of blood group B^+ with a percentage of 32.0%, while there were 4 people of blood group AB^+ with a percentage of 8.0% and finally 19/50 were of blood group O^+, with a percentage of 38.0%. As for patients infected with A. baumannii, 20/100 were of blood group A+, 23/100 of blood group B^+, 12/100 of blood group AB^+, while all the rest 45/100 were of blood group O^+, with a percentage of 45.0 %.

Statistical analysis indicated that there is a highly significant ($P \leq 0.001$) relationship between being of O^+ blood groups and infection with A. baumanni. While those of blood group B^+ ranked second. On the other hand, those with blood group A^+ and blood group AB^+, coming in third and fourth ranks respectively.

Table (3-3): The ABO distribution between the studied groups.

Blood groups	Patients group No. (%)	Control group No. (%)
A+	20 (20.0)%	11 (22.0)%
B+	23 (23.0)%	16 (32.0)%
AB+	12 (12.0)%	4 (8.0)%
O+	45 (45.0)%	19 (38.0)%
Total	100 (100.0)%	50 (100.0)%

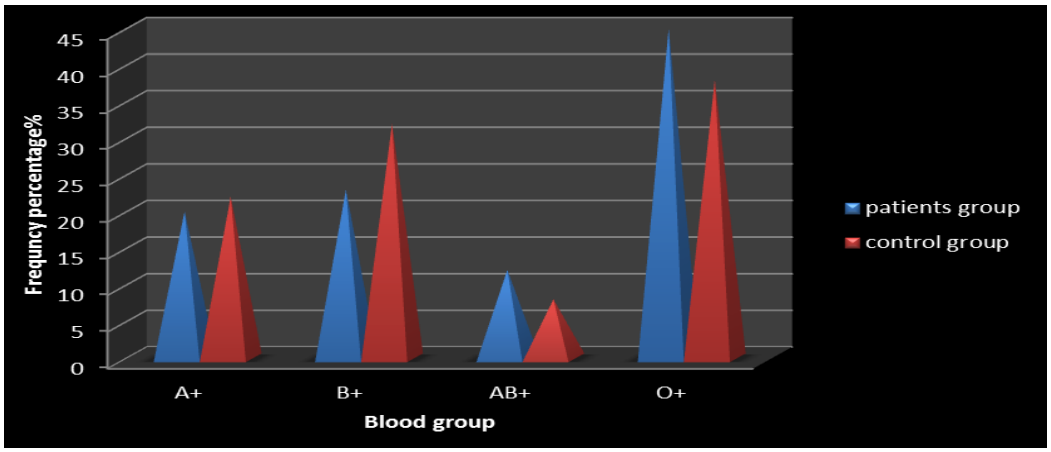

Figure (3): The ABO distribution between the studied groups.

4. Discussion

In this study, the accuracy of VITEK 2 system was shown to be 99 percent to 100 percent for identifying A. baumannii, which agrees with (Bagudo et al., 2020) and (Ganda and Aryati, 2021) who showed through their research that the accuracy of this device in diagnosing a gram-negative card BioMérieux can identify A. baumannii with up to 99%t but 98.56% for Gram positive bacteria. Instruments had a 98.56% identification accuracy for Gram positive bacteria and a 100 % identification accuracy for Gram negative bacteria (Ganda and Aryati, 2021). BioMérieux's gram-negative card can detect A. baumannii with up to 99% accuracy.(Bagudo et al., 2020).

A significantly ($P \leq 0.01$) increased level of TNF-α was observed in sera of patients infected with A. baumannii infection, that similar results were recorded by (Chen, 2020) who reported that infection with A. baumannii leads to an increase in the level of TNF-α in the patient's sera due to such deleterious infection. It represents a mechanism of resistance to multidrug-resistant A baumannii. This bacterium interacts with the host innate pattern-recognition receptors, induces a cascade of inflammatory cytokine and chemokine responses, and recruits innate immune effector cells to the site of infection for effective control of the infection.

TLR4 is a critical receptor for Gram-negative bacteria like A. baumannii to recognize their hosts. Which interacts with the lipid A fraction of LPS, which is the main component of the cell wall of A. baumannii. In turn, the activated TLR4 signaling pathway triggers an innate immune response in macrophages and DCs, which includes NF-B activation and optimum production of interleukin (IL-6), IL-12, and tumor necrosis factor (TNF-α), as well as A. baumannii death. (Kim et al., 2013).It has been shown that mast cells promote bacterial clearance by releasing different mediators, including TNF-α, which is a chemoattractant for neutrophils (Metzemaekers et al., 2020). A. baumannii adheres to mast cells via CD32 expressed in mast cells and leads to the stimulation of TNF-α, which leads to the development of inflammation and then the release of activated neutrophils (Chen, 2020). However, the interaction of A. baumannii LOS with mast cells remains unclear Although, these studies demonstrated that the interaction of A. baumannii cell membrane components with mast cells affects the expression of pro-inflammatory cytokines and chemokines (Kikuchi-Ueda,, et al., 2021).

many research and studies are dealing with the relationship between the type of blood group and bacterial infections, such as Helicobacter pylori and Pseudomonas aeruginosa..etc, we didn't find studies that focused on the relationship between infection with A. baumannii and blood group type.

Regarding the relationship between infection with H. bacteria with ABO blood groups, (Al doori et al., 2021) mentioned that there is a correlation between susceptibility to infection with this bacteria and blood type O where they were of the highest percentage (44.2%) among patients. This may be attributed to antigens of this group of blood as receptors for toxins, bacteria, and parasites that are easily colonized or avoided by host-cleansing mechanisms. Carbohydrate antigens contributed to the vulnerability of infectious diseases. In particular, for example, the H antigen of the blood group O is expressed in the gastric mucus membrane suitable for the addition of Helicobacter pylori, (Chakrani et al., 2018).

In another study conducted by (CheKuo et al., 2013) on patients infected with Pseudomonas aeruginosa, they did not find a correlation between infection with these bacteria and blood groups.

5. Conclusions

1. The method of diagnosing Acinetobacter baumannii using the VITEK device is more accurate than traditional tests, where the accuracy rate is approximately 99%.
2. Infection with A. baumannii is associated with high levels of (TNF-α) in the patients' serum, which reflects the nature of the emerging inflammatory immune response to Acinetobacter baumannii .
3. Perhaps individuals with blood group O are more receptive to infection with A. baumannii, and in contrast to those with blood group AB, they are less susceptible to such infection.

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"Study of some vital components and some antioxidants in Alzahdi date seeds powder"

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Abstract

The seeds of Alzahdi dates were separated, collected, and washed. The seeds were crushed in a special mill for grains, and the main ingredients were estimated. Then a sample was extracted from it with methanol, and the reducing force, total phenols, and inhibitory effect of the free radical were determined. The alcoholic extract was analyzed by HPLC technique to identify the concentrations of some phenols and some short-chain fatty acids. The essential fatty acids were also determined by GC technique. The percentages of the main components were as follows: moisture (6.46), fats (8.9), proteins (5.1), fibers (16.9), carbohydrates (61.6), and total energy (346.9) kcal. The reducing power was 0.188 mg (the substance was able to reduce 50% of the ferric ion) and the total phenols was 16.36 mg/g calic acid, and the antioxidant activity represented by the inhibiting effect of the free radical of 10 mg was 73.10%. Complaints of phenols were found in their concentrations. The concentration of phenols was found to be: catechol (49.5) ppm, cinnamaldehyde (87,3) ppm, 4-hydroxy benzoic (213.8) ppm and chlorogenic (273.2) ppm. The concentration of the necessary fatty acids was found as follows: oleic (46.8) ppm, followed by linolenic acid (41.4) ppm, and then linoleic acid (18.3) ppm. Thus, date seed powder was one of the richest by-products in the food industry with basic ingredients and important compounds such as phenols and essential fatty acids.

key words: phenols, essential fatty acid, HPLC, GC .

Introduction

date palm

The date palm (Phoenix dactylifera) is a major food source and an important economic crop. The date palm is one of the mainstays of society and is a renewable resource for food and energy. Worldwide, 2,000 varieties have been grown, and the rate of demand and production is increasing. Dates are recommended for consumption as they are rich in sugar, vitamins, fiber, minerals, phenols and compounds with antioxidant and anti-inflammatory properties that greatly enhance human and animal health. Date fruit is affordable and rich in fiber [27], It contains fatty acids (linoleic, lauric, palmitic, and stearic acid), carotenoids, flavonoids, potassium, calcium, magnesium and phosphorous. Dates should be in our daily diet and it is okay to use their seeds as a food and functional ingredient. [43

Date seeds

Date seeds, also called pits, seeds or grains, are by-products of the date-technalogy. Date Seeds form about 10-20% of whole dates and are sometimes wasted, causing environmental damage. While the date seeds are rich in various nutrients, As the seeds contain more protein, fiber and fat than the fleshy part of the fruit, and some studies have stated that the by-products of date fruit, especially date seeds powder, can be used by up to 10%, to replace corn or barley grains without a defect in the nutritional value content of the diet, At the same time, it adds an economic value to the product. As the date seeds are rich in basic compounds, the nutritional value of the by-products is high [14]. The date industry generates more than 10% of the total date seeds waste daily, which can be converted into useful food products. As it is available from the date industry annually (62-110) thousand tons annually in Iraq [4]), these quantities are rich in bioactive

compounds and essential oils used in many types of food, medicine and cosmetics. Recently, agricultural industry waste has increased dramatically, and in some places the method of disposing of dates industry waste in primitive ways that harm the environment, such as burning [11].

Seeds uses

The by-products of the date industry can be used instead of getting rid of them and preserving the environment [36], noting that date seeds are a rich source of biologically active compounds, which are components used in the cosmetics industry and as food additives, which have no harmful effects on the eyes [40]. The weight of the seeds depends on the size of the dates and on the variety, stage of maturity, and growth conditions. It is rich in carbohydrates, fats, and crude protein compared to barley and corn grains. It is usually used as a feed ingredient for livestock feed [20] because it contains high amounts of crude fiber, which constitutes an obstacle when used in animal food, as in poultry (51). Date seeds are used in traditional medicine or made into decaffeinated coffee despite their richness in bioactive compounds and antioxidants. Dates contain a place for storing starch in the seeds, such as the endosperm [2]. They are considered to be excellent sources of carbohydrates, dietary fiber, and insoluble dietary fiber (hemicellulose, cellulose, and lignin) [9]. As well as being very rich sources of protein, they have many other benefits, such as vitamins, minerals, carotenoids and other chemicals that may prevent cancer and heart disease [3]. Date seeds contain 5–12% oil [18] and saturated and unsaturated fatty acids (mostly monounsaturated) are found in equal amounts in date seed oil with the predominant oleic acid followed by linoleic, lauric, palmitic, and fatty acids [15, 1]. In addition to its edible oil (which has antioxidant properties) and is also rich in phenolic compounds (protocatechol acid, galic acid, tyrosol, caffeic acid, coumaric acid, and dihydroxyphenyl acetic acid), palm seed oil is also of outstanding importance. as renewable sources of energy (bio diesel) as well as the food, pharmaceutical, and medical industries (antioxidants) [17,25]. Date seeds are also used in folk remedies to treat diabetes, relieve dental pain, lower the risk of cancer and some cardiovascular diseases, improve immune system function and safety, and treat liver diseases and digestive disorders (21). The following are Muhammad's (25) estimates of the main components of Alzahdi date seeds: moisture 7.30%, ash 1.04%, protein 5.80%, fat 8.68%, fiber 11.34%, and carbohydrates 65.85%. As for Alsunbul (12), he estimated the basic components of the seeds powder of Zuhdi dates as follows: moisture 6.44%, ash 1.02%, protein 4.78%, oil 9.21%, carbohydrates 78.55%.

Some active compounds in date seeds.

The oxidative stability of date seed oils was higher than that of most vegetable oils, and one of its distinguishing properties is its antioxidant activity, which can be attributed to its antioxidant compounds, such as ascorbic acid, vitamin E, carotenoids, flavonoids, and other phenolic components (34, 19 As an antioxidant, it can inhibit active free radicals, prevent the oxidation of other molecules, and therefore, may have positive health effects in promoting the prevention of degenerative diseases. The benefit of increasing antioxidants is their ability to remove free radicals related to various diseases [45]. dates Seeds contain potassium (413.36 mg/100 g), sulfur (151.36 mg/100 g), and phosphorous (92.42 mg/100 g). The predominant unsaturated fatty acid is oleic acid, with 52.34% in the seeds and 45.92% in the pulp. The total phenol content of the pulp and seeds was 1.16 and 13.73 mg/100 g, respectively (39).

The current study aimed to estimate the total activity of phenols and antioxidant activity and to identify the amounts of some phenols, some short acids, and essential fatty acids in alzahdi seeds oil using HPLC and GC technology.

Materials and methods

Sample preparation

A sample of Alzahdi dates was taken and the seeds were separated, washed well, and dried at a temperature of 40 °C for 24 hours with ventilation and stirring. The seeds were finely ground with a seed grinder, then sifted with a fine sieve (0.5 mm), and the powder was placed in nylon bags and kept in the freezer until use.

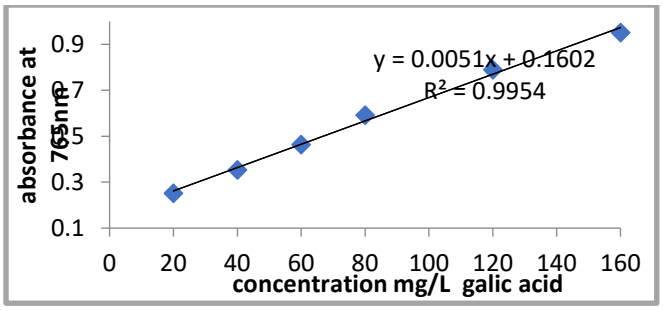
Chemicals used:

Extraction:

The phenols were extracted from the seeds powder of Alzahdi dates, where 10 g of the powder was added with 90 ml of methanol (99%) and mixed using a magnetic stirrer for half an hour, then the mixture was filtered with Whatman type filter paper No. 41 and the process was repeated on the same sample three times to extract the remaining compounds in powdered seeds and then concentrated by lyophilization until it dries(46).

Estimation of phenolic compounds:

The method of Zivkovic et al. (52) was used to estimate phenolic compounds. One-Gradient concentrations of Galic acid were prepared, including 20, 40, 80, 120, and 160 g/ml in test tubes by using volumes of 0.1, 0.2, 0.4, 0.6, and 0.8 ml of storage Galic acid solution, and completing the volume to 1 ml using methanol. To each of the tubes, 7.9 ml of distilled water, 0.5 ml of Volen's reagent, and 1.5 ml of sodium carbonate solution were added. 3-The tubes were incubated at 20°C for two hours. 4: I read the absorbance at a wavelength of 765 nm after zeroing the device. 5-Plotting the Galic acid standard curve from the relationship between the concentration of Galic acid and the absorption values at 765 nm for each concentration.



Standard Curve for Galic Acid

HPLC analysis

1- To know the concentration of some phenols

2-To identify the concentration of some short-chain fatty acids.

In the HPLC device (produced by YOUNG Company) a C18 column was used and 20 µl of the sample, the mobile phase ACN/FORMIC 50:50 was injected with 0.1% phosphoric acid, the flow rate was 1 ml/min and at a wavelength of 210 nm. The phenol concentration is calculated according to the following equation**:**

C sample = $\frac{A\ sample * C\ stander}{A\ stander}$; Whereas: C stander = 20ppm , A=area, C= concentration.

Concentration of some essential fatty acids (unsaturated bonds).

In the **GC** device (DANI-MASTER GC) use column DN10, column length (500) mm and mobile phase (ACN/FORMIC 50:50 with 0.1% phosphoric acid, flow rate 1 ml/min and (FID: detector) and the temperature (150°C-220°C at a rate of 1.5 minutes/sec and a pressure of 4psi. The acid concentration is calculated according to the following equation:

$C_{sample} = \frac{A\ sample * C\ stander}{A\ stander}$; whereas C=concentration, A=area, C stander=10ppm.

Estimation of the reducing power

The reducing power in the alcoholic extract sample was estimated according to the method described by Wu et al. [49], with slight modifications.

Working method:

The seed powder was extracted to obtain the alcoholic extract of the sample, and the reducing power of the concentrations was estimated by taking 1 ml of the extract and adding to it 1 ml of phosphate buffer solution (pH) 6.6 and 1 ml of (0.1%) ferric potassium cyanide solution in test tubes. The tubes were incubated at 50oC for 20 minutes, and after the incubation period was over, 1 ml of 10% TCA solution was added, and after mixing well, 2 ml of the mixture was withdrawn and 2 ml of distilled water and 400 l of ferric chloride solution were added. The absorbance of the samples was read at 700 nm wavelength against an equivalent sample of the sample prepared by following the same steps used above. With the extract but by adding distilled water instead of ferric chloride. The reducing power was expressed with a value of (50RC), which represents the lowest concentration of the extract capable of reducing 50% of the ferric ion to the ferrous ion.

Determination of total phenols in the sample

Estimation of the inhibitory effect of free radicals

Then the antioxidant activity of these concentrations was estimated according to the method described by Wu et al. (49) with slight modifications. 5.1 ml of each concentration was taken from the samples and 5.1 ml of 15 mM DPPH solution was added to them. The three samples were incubated for half an hour in the dark at room temperature. The absorbance was read at a wavelength of 517 nm against an efficient sample that was prepared by taking 5.1 ml of DPPH solution and 5.1 ml of extraction solvent was added to it, and the inhibitory effect of the root was calculated according to the following

equation : **Inhibitory** effect of free radical = $\frac{A-B}{B} * 100$

Whereas : (A) represents the absorbance of the sample. (B) represents the effective absorbance of the model.

Results and discussion:

The results of the tests of the main components of date seeds

The results are shown in Table 1. The seeds contain good proportions of the essential nutritional components, which increase the nutritional value of the seeds. We note that the moisture content is somewhat low, the fat percentage was high, the protein percentage was good, the fiber percentage was high, and finally, the percentage of carbohydrates was high. These results are consistent with those of Al-Shehab and Marshall [11]; Hojja [29]; and Alsunbul [12]. It differed from the results of the amber [8], which estimated the percentage of oil in the seeds of Alzahdi to be 15.35%. The percentage of oil differed greatly from other types of dates, as mentioned by Sheikh et al. (23) that the percentage of oil in Albarhi seeds was 7.79%, which is much lower than in Alzahdi seeds and approaches its percentage in Aljabjab seeds (8.5%) and in Alshaker (8.1%) (7).

Table (1) shows the proportions of the main components of date seeds

Compounds	Moisture %	Fats %	Protein%	Fibers %	Ash %	Carbohydrates %	total energy(Kcal)

seeds dates alzahdi	6.46	8.9	5.1	16.9	1.04	61.6	346.9

This difference is due to several reasons, including the quality of the crop, the conditions of cultivation, the availability of irrigation water, the fluctuations of the environment, and countless other conditions [39]. The total energy in the seeds powder according to the results in Table (1) is estimated at 346.90 (Kcal), but Hinkaew [27] mentioned that the total energy from the seeds of other varieties is 441.21-442.85 Kcal, and each researcher has his own results according to the quality and quality of the crop.

Determination of total phenols

The results showed that Alzahdi date seeds powder possesses a good amount of total phenols of 16.36 mg/gm of calic acid, and this amount varies according to the date variety. This result differed from what Ardekani et al. [14] mentioned, that the amount of phenols in tamarind seeds was 14.48 mg/g of galic acid, while Hinkaew et al. [28] found that the amount of phenols in tamarind seeds was 18.41 mg/g of galic acid. ..Total phenols were estimated because of their importance as antioxidants, and Saqr [42] showed that phenols have an ideal formula to get rid of free radicals and are practically more effective than tocopherols and ascorbate, as they prevent the formation of peroxides by sequestering free radicals, and phenols are a means important in the binding of free oxygen radicals during stress. According to the results obtained in terms of the percentage of total phenols, seeds Alzahdi powder can be used as an important and cheap source of natural antioxidants.

The results of the analysis of alcoholic date seeds extract by HPLC technique device to identify some phenols:

The results are shown in Table (2) for analysis using HPLC technique. The compounds whose concentration was less than 0.02 ppm were pyrogallol, gallic acid, rutin, and kaempferol. While the concentration of lignan was 5.860 ppm, followed by eugenol with a concentration of 6.998 ppm, cinnamic at a concentration of 14.356 ppm, and for catechol with a concentration of 49.529 ppm, as well as cinnamaldehyde with a concentration of 87.356 ppm

Table (2) shows the concentrations of phenolic compounds (ppm) extracted from the graph of the HPLC analyzer.

Compound	pyrogallol	gallic acid	Rutin	Kaempferol	lignan	Eugenol	Cinnamic	Catechol	cinnamaldehyde	4-hydroxybenzoic	Chlorogenic
Conc. Ppm	0.0149	0.0304	0.016	0.0122	5.860	6.998	14.356	49.529	87.356	213.871	273.208

, the last two compounds, 4-hydroxy benzoic with a concentration of 213.871 ppm, and the last concentration of chlorine was 273.208 ppm, which was high. Most of the activity of phenols was because of these compounds' high concentrations.

The antioxidant activity of polyphenols depends mainly on the properties of their hydroxyl groups and the structural forms they adopt among different parts of their chemical structure [38]. Hence, the total polyphenol content of the extract increases antioxidant activity. The high antioxidant activity may be due to the high concentration of phenols in the date seeds extract. These compounds are an important group of natural antioxidants with positive effects on human health [34], helping to protect against the harmful action of active oxygen species. These compounds are also known to activate antioxidant activity by restricting free radical activity by donating an electron or hydrogen [30]. The difference

in

results can be explained by various factors such as variety, growth condition, maturity, season, geographic origin, soil type, storage condition, amount of sunlight received, culture methods, stability conditions, stability conditions, use of different analytical methods and use of different technical parameters [33].

Estimation of the inhibitory effect of free radical

The results showed that the antioxidant activity represented by the inhibiting effect of free radicals at a concentration of 10 mg is 73.1%, at a concentration of 5 mg is 36.8%, and at a concentration of 1 mg is 5.4%.%, This result was good, and Bedford (17) stated that the percentage of free radical inhibition in the seeds of the Khadrawi cultivar was 55.470% and in the seeds of the Fade cultivar was 33.120%, and this antioxidant capacity is closely related to polyphenols Some studies mentioned that date seeds have a high percentage of phenols and a higher antioxidant activity than the fruit part of the date [32]. Therefore, date seeds drew attention to the by-product because it contains valuable and biologically active compounds that can be a promising nutritional supplement.

Results of Estimation of Reducing Power

The results showed that the lowest concentration of the date seeds extract was able to

Reduction of 50% of the ferric ion to the ferrous ion in the order of 0.188 mg.

The results of the analysis of the seeds oil by HPLC device

Table No. (3) showed the HPLC technique analysis of the seeds oil and it was found that the concentration of propionic acid was the highest, with its concentration reaching 20.00ppm, followed by formic acid, then lactic acid, acetic acid and butyric acid. Propionic and lactic acid are important in the preservation process of food and pharmaceutical products, dyes, and an antibiotic against biodegradation as a result of bacterial growth [24].

Table No. (3) The results of the analysis of seeds oil to determine the concentration of short-chain fatty acids

Compound Name	Reten.tim (min)	Area (mV.s)	Height (mV)	Area (%)	Height (%)	WO5 (min)	Sample Conc. Ppm
Formic acid	4.11	437.852	114.809	1.1	2.1	0.06	2.387694
Lactic acid	4.363	112.683	25.624	0.3	0.5	0.06	0.783623
Acetic acid	4.87	15.490	3.843	0.0	0.1	0.12	0.186824
Propionic acid	6.697	1881.422	165.275	4.9	3.0	0.19	20.00077
Butyric acid	13.833	9.757	2.764	0.0	0.1	0.05	0.082091

Butyric acid is important in animal and fish feed. Butyrate provides energy for colon cells, is a regulator of gut cell functions, reducing oxidative stress, controlling diarrhea, reducing inflammation, improving growth performance, and modulating the gut microbiome. It is considered an alternative to antibiotics in feed (17.)

The results of the GC analysis of kernel oil for the detection of some long-chain and unsaturated fatty acids

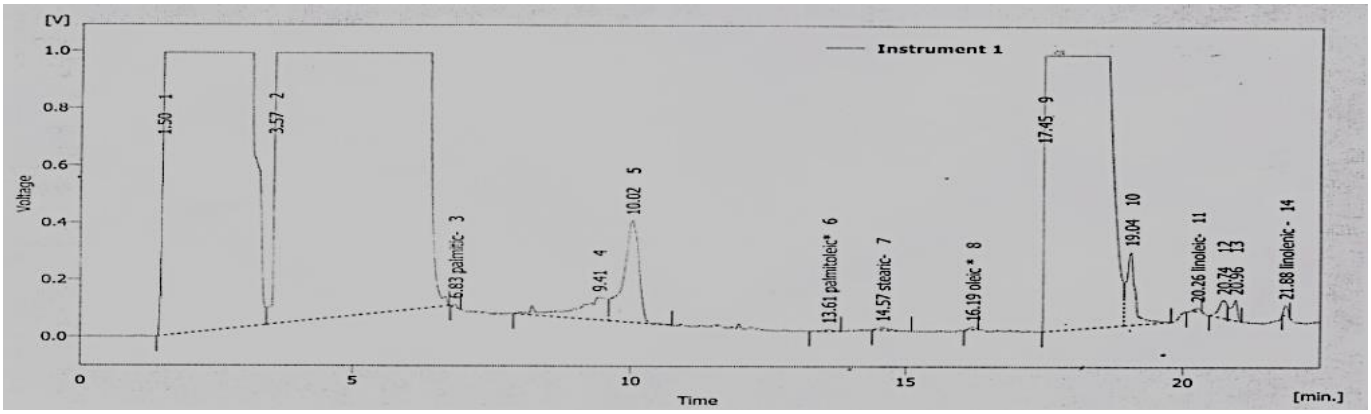


Figure (2) The graph of the analysis of unsaturated acids in ascetic seeds oil by **GC**

The results showed in Table No.(4) the concentration of some long-chain acids and the concentration of unsaturated and essential acids for foods, which is what is meant here in the analysis.

Table No. (4) Concentration of some unsaturated acids in alzahdi date seeds oil (C, ppm concentration and A = area

C sample (ppm)	(A) of stander	(A) Aerea of sample	C stander =10
88.258	483.86	54.823	Palmitic
10.589	77.26	72.959	Palmitolei c
25.423	376.201	147.971	Stearic
46.820	333.737	71.281	Oleic
18.373	149.809	81.536	Linoleic
41.493	779.080	187.758	Linolenic

It is clear that the concentration of oleic acid is the highest concentration among the unsaturated acids in alzahdi seed oil, oleic, which is 46.82 ppm. Linolenic acid (41.493 ppm) and linoleic acid (18.373) ppm. These acids are essential in the nutrition that the organism needs and must be obtained with its food. Many studies have stated that linolenic (omega-3) is of particular importance in the diet due to the acid's role in metabolism and its activity against inflammation in the body; it prevents the formation of lipids and fats (43, 31). On the contrary, omega-6 linoleic acid and its derivatives, long-chain arachidonic acid, promote lipogenesis in vivo [(6)].

Conclusion

Alzahdi seeds contain high proportions of essential nutritional components such as oil, protein, carbohydrates, and fibers, which are higher than in the whole date or in the fleshy body of the date, and this is important as a fodder source or a food source rich in essential nutritional components. It is a good proportion of essential fatty acids such as linoleic and linolenic acid, and it was shown that the seed powder of Alzahdi has the antioxidant power of a number of phenolic compounds such as propionic acid and formic acid, which have antioxidant activity. Date manufacturers should pay attention to this source, which is rich in basic high-energy nutritional compounds and effective biological compounds, and exploit them scientifically and economically.

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"Studying the Effect of Fungal keratitis on some Physiological and Immunological Variables"

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Abstract

Background Fungal Keratitis is an infection of the cornea (the transparent dome that covers the colored part of the eye) caused by fungi, including some fungi known to cause fungal keratitis**.** **Methodology** It was determined that the cornea could be inoculated with SBA, CA, and PDA if an ophthalmologist employed an aseptic technique and a sterilized Kimura's spatula to scrape the surface of the eye (PDA). The leftover material was placed on two clear glass slides and stained with 10% KOH wet mount and Gram staining. A direct microscopy examination of ocular scrapings revealed fungal filaments. In order to carry out the PCR experiment, corneal scrapings were necessary. The samples were collected and stored at 20°C in 400 liters of lysis buffer (0.5M Tris HCL, 0.5M EDTA, 3 percent SDS, 1 percent -mercaptoethanol). **Result** shows the effect of fungal keratitis on some hematological variables, including the total number of white blood cells, the total number of white blood cells of a single cell type, and the number of lymphocytes, where there was an increase in the total number of all types of white blood cells when infected with Fusarium and Aspergillus fungi in both male sexes. And in females, where there was an increase in the total number of white blood cells in males more than in females, where it reached 9372 in males, while in females, the number was 8266 when infected with Fusarium fungus, and when infected with the second type of Aspergillus fungus, the number of white blood cells in males was 8665, and in females It was less than this percentage 7566. It was also noted that the number of white blood cells, monocytes and lymphocytes was more in males than in females.

Keywords: fungal keratitis, physiological and immunological variables

Introduction

Pathogenic fungi known as dermatophytes assault the skin by infecting it. Trichophyton, Microsporum, and Epidermophyton are the three imperfect fungi that make up this family. [(1)] More than 40 species are found in these three genera, which represent asexual stages. [(2)] The following are the sexes of the species that may reproduce sexually, Ascomycetes and a variety of other fungi Infections of the hair, skin, and nails are caused by the dermatophytes because they feed on keratinized substances. [(3)] The secondary metabolites of the fungus cause inflammation in the keratinized tissue where they establish colonies. [(4)] Due to their inability to enter the live tissues of the host with a functioning immune system, the prevalence of these fungi in the stratum corneum

of the epidermis is often limited. Host immune response is moderate to severe when this virus is present.[5] A variety of proteolytic enzymes, such as proteinase, elastase, keratinase, and others, contribute to the fungus' pathogenicity [6] The host's cellular immunity developing with delayed hypersensitivity would also help recovery, in contrast to hosts that have difficulties with their cellular immunity and are thus vulnerable to chronic or repeated fungal infections.[7] Ringworm, or tinea capitis, is the medical term for an infection caused by dermatophytes. It's difficult for these fungi to penetrate live tissue, but they can do so in rare situations, leading to the creation of a kerion.

Fungal Keratitis

Leber described fungal keratitis for the first time in 1879. This bacterium is a major cause of corneal infection in poor countries, but is uncommon in the West. (8) If an issue is not identified and addressed promptly and effectively, it might have catastrophic implications. (9) Keratitis is a general term that refers to any inflammation of the cornea. (10) A fungal infection of the cornea is referred to as "fungal keratitis." Fusarium is a fungal infection that may infect the eye. (11) Fusarium keratitis is the medical name for an infection of the cornea caused by Fusarium. (12) Diagnosing and treating fungal keratitis remains challenging for the ophthalmologist during the disease's early stages. Identifying the fungal infection, diagnosing keratitis, and appropriately treating it with topical antifungal medicines are all difficult tasks.. [13] Unfortunately, a lack of suspicion often results in a delayed diagnosis. Antifungal medications have a poor ocular penetration, making treatment difficult even if a diagnosis is made. Fungal keratitis has increased in frequency during the previous three decades. Fungal keratitis is on the rise because of an increase in the use of topical corticosteroids and antibacterial medications to treat keratitis. Improvements in laboratory capabilities are helping to raise awareness of fungal keratitis (16).

Fungus caused corneal inflammation

A fungal infection of the cornea has emerged as a major global eye disease, with a high risk of blindness. India has the highest number of culture-positive cases of fungal corneal infections in the world (18). A country's incidence rate can vary greatly depending on its demographics and location (19). According to numerous studies in the South Indian region (20), keratitis is caused by Aspergillus and Fusarium. There are several deadly illnesses caused by the fungi Fusarium and

Aspergillus in both crops and immunocompromised individuals. In addition, they have long been suspected of causing eye infections, such as keratitis, which can lead to blindness (9). In India, there are ten different species of Fusarium and Aspergillus that can cause corneal ulcers in people regardless of where they are located. The public's understanding of fungal keratitis has grown significantly since a large-scale outbreak among contact lens wearers occurred in 2005. (11). To be clear, the result of fungal keratitis is substantially worse than bacterial, in part because of poor treatment response and restricted antifungal medication availability. This has to be stressed (3). The most challenging part of treating fungal keratitis for ophthalmologists is figuring out the cause and treating it. Additionally, the use of inadvertent antifungal drugs and the long-term persistence of the illness worsen the prognosis of fungal keratitis (6). Despite the fact that voriconazole and other triazoles are broad-spectrum drugs, clinical trials have shown that no one therapy is effective against fungal keratitis. In addition, itraconazole and caspofungin failed to combat Fusarium spp. growths (8). Standard culture methods take a long time to grow and identify the disease's cause, but they are effective. These disorders can be diagnosed more quickly and accurately using molecular technology. There is also a dearth of commercially available antifungal drugs, as well as a general lack of interest in discovering a therapy for corneal infection. Antifungal susceptibility pattern analysis and the development of a quick diagnostic tool are essential in Tamil Nadu, India, where fungal keratitis is becoming more common. If multiplex PCR is more successful than traditional culture for quickly diagnosing fungal infections that cause keratitis, then this study was conducted. In a study published in the Journal of the American Medical Association, the minimum inhibitory concentration (MIC) of antifungal medications used to treat corneal ulcers was 4. Ophthalmologists in the United States are seeing an increase in instances of Fusarium/Aspergillus keratitis, and this study provides information on medication susceptibilities that might help them make more educated treatment decisions.

Methodology

There was a total of 50 corneal scraping specimens taken from mycotic keratitis patients that visited Ramadi Hospital.

Collection of Specimens

It was determined that the cornea could be inoculated with SBA, CA, and PDA if an ophthalmologist employed an aseptic technique and a sterilized Kimura's spatula to scrape the

surface of the eye (PDA). The leftover material was placed on two clear glass slides and stained with 10% KOH wet mount and Gram staining. A direct microscopy examination of ocular scrapings revealed fungal filaments. In order to carry out the PCR experiment, corneal scrapings were necessary. The samples were collected and stored at 20°C in 400 liters of lysis buffer (0.5M Tris HCL, 0.5M EDTA, 3 percent SDS, 1 percent -mercaptoethanol). (4)

This method is used to identify the many species of both Fusarium and Aspergillus

All of the fungal isolates were identified using microscopy and lacto-phenol cotton blue staining. To preserve the found isolates, it was stored at 4°C in 0.85 percent saline. An ophthalmologist or optometrist examines the patient's medical history, signs, and symptoms to arrive at a diagnosis. It's conceivable that a bacterial ulcer has been confused for this. A positive culture report (lactophenol cotton blue, calcoflour medium) takes about a week to develop and is based on corneal scrapings. Improvements in PCR ref. 3/immunological testing have lately resulted in faster PCR ref 3.

Result

Table 1 Effect of fungal keratitis on some biochemical variables

Descriptive Statistics

Blood var.	gender	type of funji	Mean	Std. Deviation
WBC count	male	Fusarium	9392.86	2237.603
		Aspergillus	8656.25	2560.721
		Total	9000.00	2403.302
	female	Fusarium	8566.67	2569.510
		Aspergillus	7066.67	2737.743
		Total	7816.67	2718.022
	Total	Fusarium	8965.52	2408.805
		Aspergillus	7887.10	2725.526
		Total	8408.33	2612.700
monocytes	male	Fusarium	685.71	436.520
		Aspergillus	481.25	200.728
		Total	576.67	342.086
	female	Fusarium	606.67	284.019

		Aspergillus	420.00	156.753
		Total	513.33	244.573
	Total	Fusarium	644.83	361.135
		Aspergillus	451.61	180.501
		Total	545.00	296.548
lymphocytes	male	Fusarium	1892.86	923.592
		Aspergillus	1287.50	655.108
		Total	1570.00	835.897
	female	Fusarium	1693.33	709.594
		Aspergillus	1440.00	958.272

Table 1 shows the effect of fungal keratitis on some hematological variables, including the total number of white blood cells, the total number of white blood cells of a single cell type, and the number of lymphocytes, where there was an increase in the total number of all types of white blood cells when infected with Fusarium and Aspergillus fungi in both male sexes. And in females, where there was an increase in the total number of white blood cells in males more than in females, where it reached 9372 in males, while in females, the number was 8266 when infected with Fusarium fungus, and when infected with the second type of Aspergillus fungus, the number of white blood cells in males was 8665, and in females It was less than this percentage 7566. It was also noted that the number of white blood cells, monocytes and lymphocytes was more in males than in females.

Table 2 ANOVA table of Effect of fungal keratitis on some biochemical variables

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	WBC count	41930505.950[a]	3	13976835.320	2.169	.102
	monocytes	633648.810[b]	3	211216.270	2.597	.061
	lymphocytes	3217714.286[c]	3	1072571.429	1.605	.199
Intercept	WBC count	4244925207.000	1	4244925207.000	658.830	.000
	monocytes	18004873.380	1	18004873.380	221.362	.000
	lymphocytes	149152149.000	1	149152149.000	223.138	.000
gender	WBC count	21836120.280	1	21836120.280	3.389	.071
	monocytes	73648.438	1	73648.438	.905	.345
	lymphocytes	8273.677	1	8273.677	.012	.912

type	WBC count	18717263.560	1	18717263.560	2.905	.094
	monocytes	572410.131	1	572410.131	7.038	.010
	lymphocytes	2758901.739	1	2758901.739	4.127	.047
gender * type	WBC count	2180515.232	1	2180515.232	.338	.563
	monocytes	1185.187	1	1185.187	.015	.904
	lymphocytes	463667.886	1	463667.886	.694	.408

a. R Squared = .104 (Adjusted R Squared = .056)

b. R Squared = .122 (Adjusted R Squared = .075)

c. R Squared = .079 (Adjusted R Squared = .030)

Some hematological variables were not significantly affected by the gender of the patient, and there were no significant differences in the effect of pathogenic fungi or the type of pathogens that were used to treat this disease. Table 2 shows an analysis of variance for this disease's effect on these variables. Inflammation of the cornea, the dome-like tissue that covers the pupil and iris, is known as keratitis. Infectious or non-infectious causes can lead to keratitis in the eye. A minor damage, such as wearing contact lenses for an extended period of time or having an object enter the eye, can result in noninfectious keratitis. Infections like as bacteria, viruses, fungus, and parasites can cause keratitis. Immediately seek medical attention if you see eye redness or other signs of keratitis. As long as the condition is treated quickly, mild to severe keratitis may typically be cured without the loss of vision. Keratitis can cause irreversible eyesight loss if left untreated or if the infection becomes too severe.

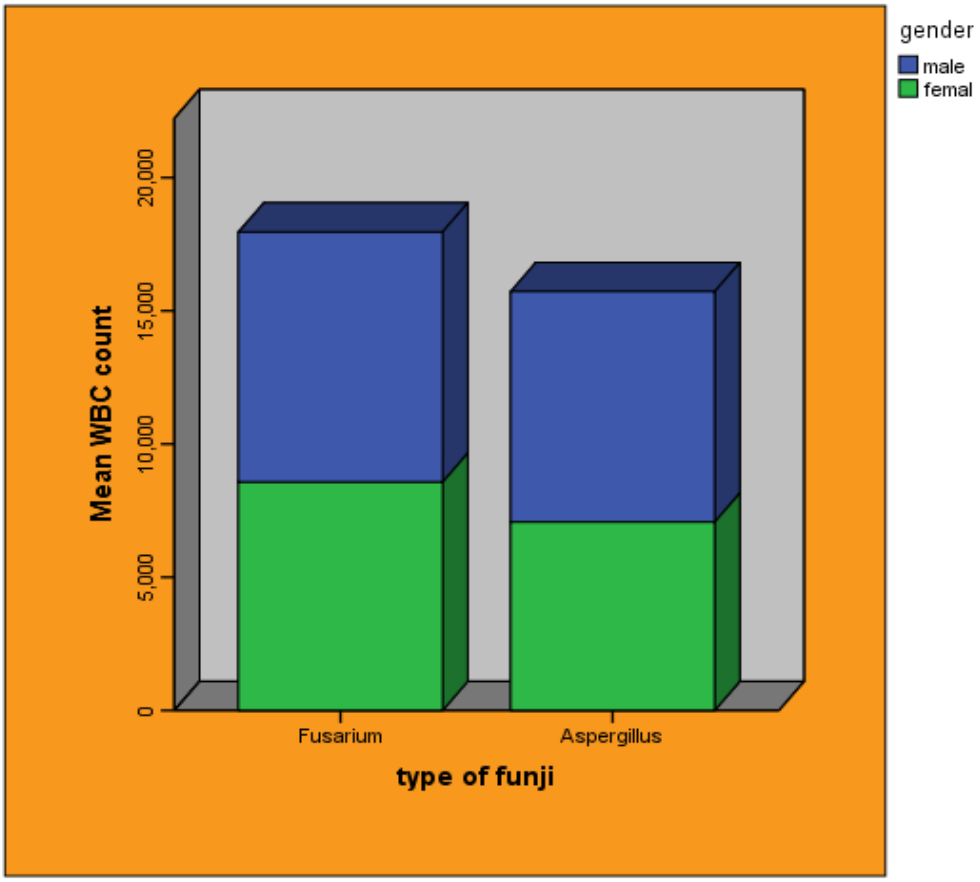

Figure 1 Effect of fungal keratitis on total count of WBC

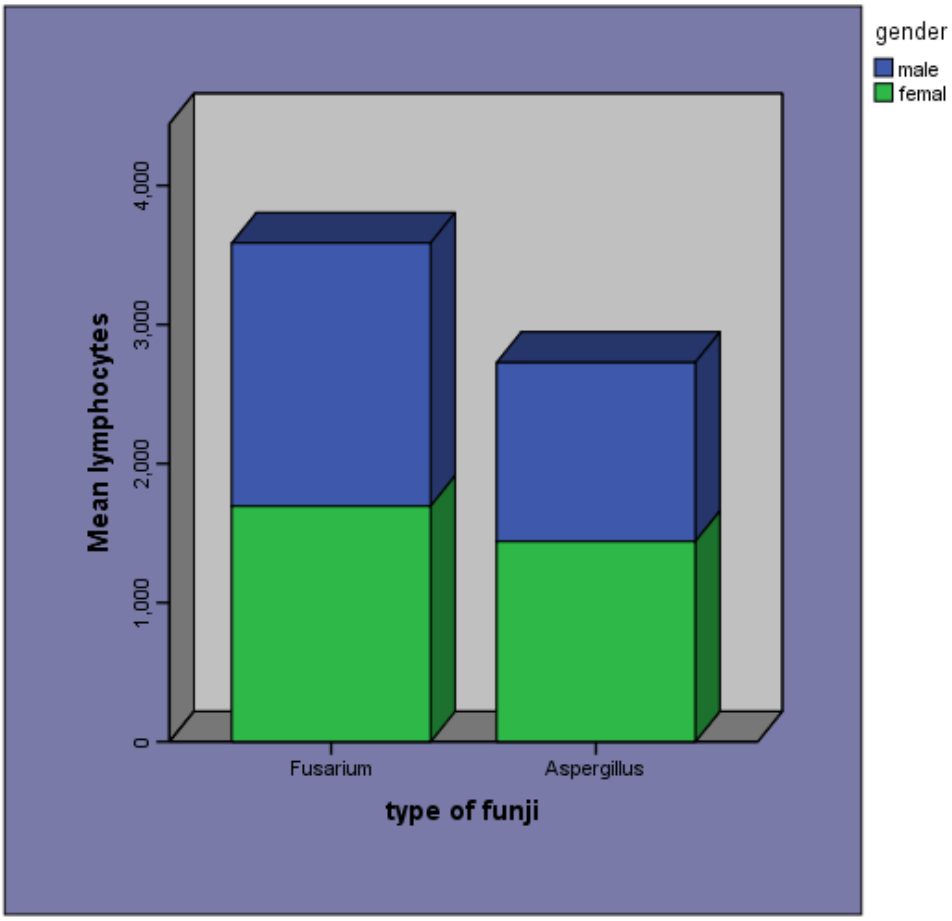

Figure 2 Effect of fungal keratitis on total count of monocytes

Table 3 Effect of fungal keratitis on C3 and C4 concentration

Descriptive Statistics

Test	gender	type of funji	Mean	Std. Deviation
C3 concentration mg/dl	male	Fusarium	260.00	65.192
		Aspergillus	178.80	21.626
		control	63.60	10.784
		Total	167.47	91.313
	female	Fusarium	388.00	75.631
		Aspergillus	242.00	37.014
		control	64.00	12.329
		Total	231.33	144.485
	Total	Fusarium	324.00	94.775
		Aspergillus	210.40	43.889
		control	63.80	10.922
		Total	199.40	123.118
C4 concentration mg/dl	male	Fusarium	84.40	6.348
		Aspergillus	57.80	12.598
		control	12.00	1.225
		Total	51.40	31.863
	female	Fusarium	83.80	12.194
		Aspergillus	63.80	12.050
		control	11.60	1.140
		Total	53.07	32.817
	Total	Fusarium	84.10	9.171
		Aspergillus	60.80	12.044
		control	11.80	1.135
		Total	52.23	31.792

Table 3 shows the effect of fungal keratitis on some of the complement system proteins in both sexes, males and females. The concentration of C3 in men was 260, and in females, it was 388 when infected with Fusarium, and its concentration in men was 178 mg/100 ml, and in women it was 210 mg/100 ml when infected with Aspergillus fungus. These concentrations are considered high when compared with the control, whose concentration reached 63, meaning there are significant significant differences, which means that there is a great immune response to this type

of fungi, which was greater in women than in men. The C4 concentration in men was 84 and 54 mg/100 ml when infected with Fusarium and Aspergillus, respectively, and its concentration in women was 83 and 63 with Fusarium and Aspergillus infection, respectively, compared to the control of 11 mg/100 ml, and this indicates a significant immune response when compared to the control.

Table 4 ANOVA table of Effect of fungal keratitis on C3 and C4 concentration

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	C3 concentration mg/dl	391281.200[a]	5	78256.240	38.882	.000
	C4 concentration mg/dl	27328.567[b]	5	5465.713	66.158	.000
Intercept	C3 concentration mg/dl	1192810.800	1	1192810.800	592.652	.000
	C4 concentration mg/dl	81849.633	1	81849.633	990.716	.000
gender	C3 concentration mg/dl	30592.133	1	30592.133	15.200	.001
	C4 concentration mg/dl	20.833	1	20.833	.252	.620
type	C3 concentration mg/dl	340335.200	2	170167.600	84.548	.000
	C4 concentration mg/dl	27237.267	2	13618.633	164.841	.000
gender * type	C3 concentration mg/dl	20353.867	2	10176.933	5.056	.015
	C4 concentration mg/dl	70.467	2	35.233	.426	.658
Error	C3 concentration mg/dl	48304.000	24	2012.667		
	C4 concentration mg/dl	1982.800	24	82.617		

a. R Squared = .890 (Adjusted R Squared = .867)

b. R Squared = .932 (Adjusted R Squared = .918)

Table 4: Analysis of variance for the effect of fungal keratitis infection on the proteins of the complement system C3 and C4. We note that there are significant differences for the effect of gender on C3 protein, where the significance function was 0.01, and there were no significant differences for gender on C4 protein, and there were significant differences for the type of fungi on C3 and C4 proteins. No significant differences were observed for the effect of the interaction of sex with fungi on C3 and C4 proteins. C3 and C4, and these are proteins that increase in cases of inflammation or cases of autoimmune diseases, when exposed to many and many bacterial diseases, this indicates the presence of a deficiency of these two factors, and also in cases of immune diseases such as immune blood diseases or rheumatic diseases, it will naturally be high in the case

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