



COVID-19 Pandemic Research Outcomes in Arab Universities

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The main purpose of the present study was to assess scientific output on COVID-19 Pandemic published by Arab Universities and to identify key issues relating to the engagement of scientists and medical professionals from Arab universities in supporting the continuation of teaching and learning during the COVID-19 Pandemic and adapting best health practice measures to help save lives. The study was descriptive and based on respondents to call for a prize award allocated by the association of Arab universities (AARU). Calls for research on COVID-19 award application was sent by email to AARU universities members and asked them to submit their COVID-19 Pandemic research relevant to the three areas of the pandemic specified by the prize committee: treatment, Spreading, and prevention measures and meet the following general requirements; the research submitted must be of high quality and published in peer-reviewed journals that have a good scientific reputation regionally or internationally, the principal researcher is affiliated to a university or research center in one of the Arab countries. We received 577 research documents written in English. 225 in Prevention and Protection 177 in treatment and 175 in Spreading, from United Arab Emirates, Bahrain, Kuwait, Saudi Arabia, Yemen, Qatar, Oman, Jordan, Syria, Lebanon, and Palestine, Iraq, Egypt, Morocco, Libya, Tunisia, Algeria, Sudan, Mauritania, Somalia, and Djibouti. The results of the research documents provide an overview of publishing trends in the business, education, and health fields. The most common studies are web-based surveys, meta-analyses, published articles, submitted articles, reviews, conference presentations, letters to the editorial on the effects and impact of COVID-19 Lockdown on physical activity, sedentary behavior, exploring the social psychology responses and level of psychological stress, prevalence, predictors of depression, anxiety, and stress, teachers' responses to school closure, distance education as a response to pandemics Challenges and Solutions, COVID-19 Vaccine hesitancy and resistance. Impact of the COVID-19 pandemic on hemodialysis patients and patients with migraine. The prevalence of positive COVID-19 among asymptomatic health care

workers, health information behavior during COVID-19 multiple sclerosis and COVID-19 infection, the legal regulation of world trade and business activities, Spillover of COVID-19: impact on the stock market and gold price volatility manufacturing and service supply chain resilience electricity demand and medical supplies shortages COVID-19 spread - nonlinear modeling and simulation. Supporting SARS-CoV-2 Papain-Like Protease Drug Discovery: In silico Methods and Benchmarking, Sera Containing neutralizing antibodies collected from COVID-19-recovered patients as a probable therapy. 70 articles were met the aforementioned criteria and were published in a peer-reviewed, indexed journal in 2020 and 2021 of which 20 articles published in journals with Scopus cite score 2020 ranged between 16.5 and 1.1.

Key words: *coronavirus, COVID-19 Pandemic, Association of Arab Universities, Arab universities Research outcomes*

Introduction

In March 2020 as the World Health Organization declared the global outbreak of COVID-19 to be a pandemic, many university campuses around the world announced the closure of their universities to overcome the spread of the COVID-19 virus and moved to remote learning and online education. (WHO, 2020). The outbreak of the COVID-19 Pandemic has become a major disruption to Arab universities across the Arab world, with most universities canceling face-to-face classes and moving to online learning. The pandemic alters nearly every aspect of university life. These concerns extend to research outcomes due to considerable financial instability in the form of unexpected costs and potential reductions in revenue and the closing of research laboratories. (UN, 2020) International cooperation in research, education, and innovation offers universities a channel to strengthen the quality of research and foster solutions to common challenges. The sharing of knowledge and research outcomes has become more crucial than ever to overcome the COVID-19 pandemic especially in developing countries (Mikhael, and Al-Jumaili, 2020). Hunaiti (2020) pointed out that according to 2018 statistics the total number of universities and institutions in the Arab countries is 1166, of which 264 governmental universities, 286 private universities, and 616 colleges and institutions. The governance of universities around the Arab world varies from nation to nation and this diverse structure of the governance arrangements made it challenging to answer the question: who makes the decisions to overcome the impact of the COVID-19 pandemic on research outcomes. Never the less Arab university researchers within multidisciplinary and multiple stakeholder teams explore the rising research field of public health surveillance studies focused on spreading, transmissibility, and effective protection and prevention measures and are eager to contribute to the global research roadmap (Hunaiti,2020). Several universities have adopted and embedded protection and prevention measures into their curricula, and as such, have evolved into a variety of new remote teaching approaches especially For healthcare For



example, some universities create learning communities where a small number of the same students attend classes, laboratories and libraries for portions of the week while others have hubs offering training pivot to the simulated environment and offering a professional course in Bio risk management. (5). COVID-19 motivates researchers from all over the world to channel their scientific activity towards confronting the pandemic and several studies suggest that the COVID-19 pandemic resulted in the generation of a large amount of scientific data, and demonstrates potential problems regarding the information velocity, availability, and scientific collaboration in the early stages of the pandemic (Homolak, Kodvanj, and Virag, 2020) and several publishers offered online and open access publications on the disease, which are now available to the scientific community (Chahrour, Assi, Bejjani M, et al,2020) (Tonacci, Genovese, Pioggia, et al 2021). Evaluating scientific output on a certain topic is important from a strategic and decision-making point of view for any country. Thus, the present study aimed to characterize scientific output on the COVID-19 Pandemic published by Arab Universities and to identify key issues relating to the engagement of Arab universities on COVID -19 prevention.

Methodology

This study was conducted via a convenience sample through a call for a prize application award allocated by the association of Arab universities (AArU for research on COVID-19 and was sent by email to 326 AArU universities members. prospective participant's universities and researchers were invited to submit their Pandemic research contributions relevant to the three areas of the pandemic specified by the prize committee: treatment, Spreading, and prevention measures between May 27, and June 7th, 2021, provided that they meet the following general requirements; the research submitted must be of high quality and published in peer-reviewed journals that have a good scientific reputation regionally or internationally, the principal researcher is affiliated to a university or research center in one of the Arab countries. All documents received were reviewed by three reviewers and categorized by type of research area, and type of publication. The study builds on the analysis of research published between March 2020, &May 21, 2021, and excluded all articles published pre 2020 and those published in none English language.

Ethical considerations

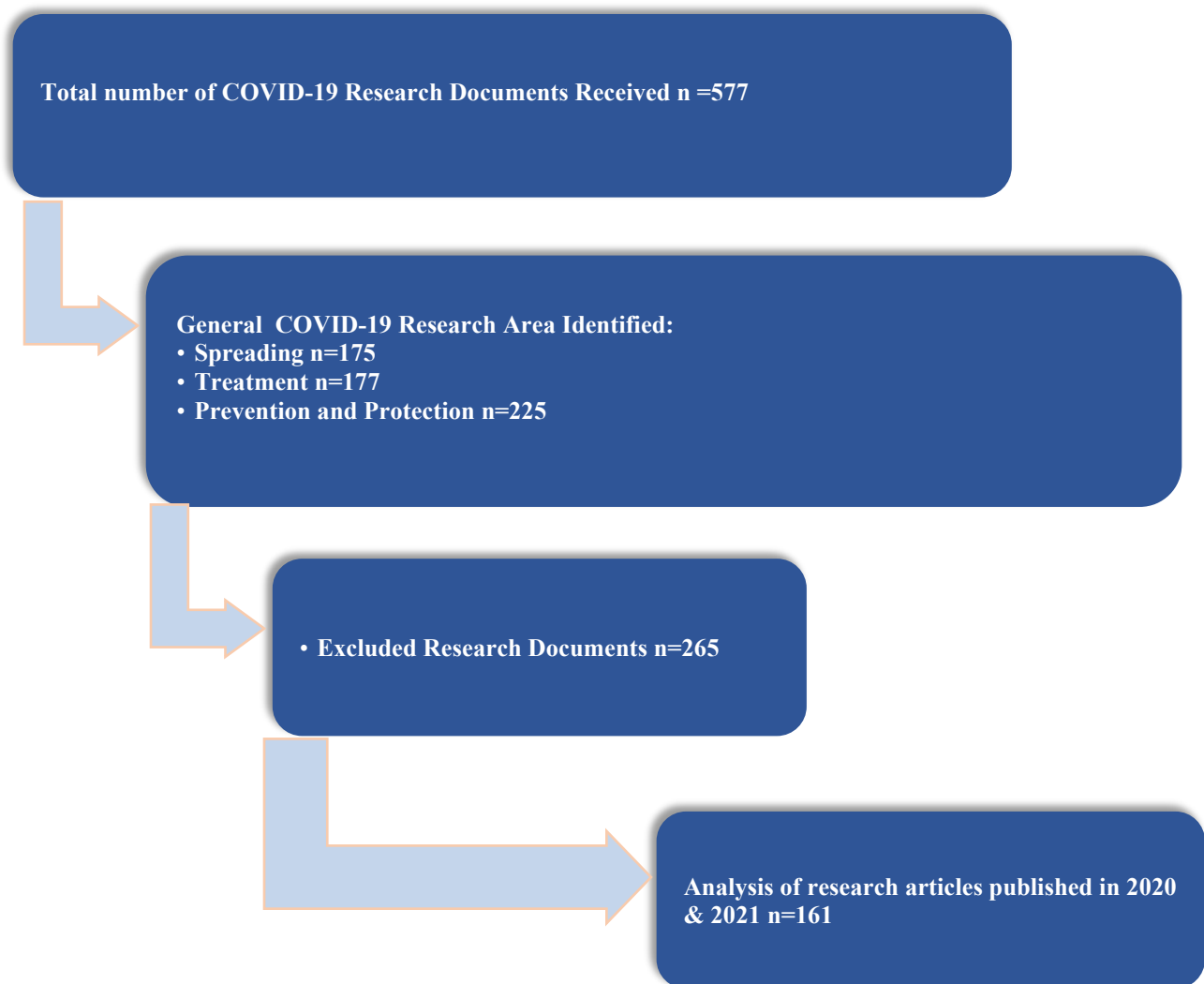
As this was an analysis of available published research, no ethics approval was required

Results

Based on respondents to call for a prize application award allocated by the association of Arab universities (AArU) for research on COVID-19 researchers from a large variety of disciplines participated. The total number of research documents received n=577 from 21 countries described the impact of the COVID-19 crisis across its different dimensions: health, economic,

social, and fiscal. Of which 225 in Prevention and Protection 177 in treatment and 175 in Spreading as shown in fig 1. Excluded documents were 265 which compromised about 45.9% of the received documents. Reviewers' analysis of the rest of the documents showed that 161 documents were closely aligned with the set inclusion criteria.

Fig 1. Flow chart of the COVID-19 Research Documents Received from Arab Researchers and subset analysis



Furthermore, by applying Outcome measures related to article type, topic, research design, and journal type only 70 articles were included in table 1.

Table 1: List of covid-19 Research Articles Journals Published in 2020 and 2021

1	Annals of Medicine and Surgery		impact of COVID-19 on the surgical operations
2	Journal Of Archaeology Of Egypt/Egyptology		Foreign Languages E-Learning: Challenges, Obstacles and Behaviours during COVID-19 Pandemic in Jordan
3	Infection, Genetics and Evolution	2021	The dynamic association between COVID-19 and chronic disorders: An updated insight into prevalence, mechanisms and therapeutic modalities
4-7	Int J Clin Pract	2021 2021 2021	4-Assessment and characterization of post-COVID-19 manifestations 5- NON-SYSTEMATIC REVIEW RESPIRATORY MEDICINE COVID-19; current situation and recommended interventions 6- INFECTIOUS DISEASES A study of the possible factors affecting COVID-19 spread, severity and mortality and the effect of social distancing on these factors: Machine learning forecasting model 7- PRIMARY CARE Fear of COVID-19 and stigmatization towards infected people among Jordanian people
8	Educ. Sci	2021	Emergency Online Learning in Low-Resource Settings: Effective Student Engagement Strategies
9	Global Journal of Environmental Science and Management	2020	The dramatic impact of Coronavirus outbreak on air quality:
10-11	Journal of Legal, Ethical and Regulatory Issues.	2021 2021	10- IMPACT OF ISLAMIC LAW & PSYCHOLOGICAL PROBLEMS CAUSED BY COVID19: ANALYTIC STUDY 11- EFFECTS OF COVID-19 PANDEMIC ON CONTRACTUAL RELATIONS
12	Multiple Sclerosis and Related Disorders	2021	Registry of patients with multiple sclerosis and COVID-19 infection in Saudi Arabia,

13	Clinical Neurology and Neurosurgery	2020	Impact of coronavirus disease (COVID-19) pandemic on multiple sclerosis care
14	Vaccines	2021	Prevalence and Potential Determinants of COVID-19 Vaccine 2 Hesitancy and Resistance in Qatar
15	COMMUNITY PSYCHOLOGY WILEY	2021	Mental health of individuals who are deaf during COVID-19: Depression, anxiety, aggression, and fear
16	Psychiatria Danubina	2020	THE IMPACT OF THE CORONAVIRUS PANDEMIC ON MENTAL HEALTH AMONG AL AIN UNIVERSITY STUDENTS IN LIGHT OF SOME DEMOGRAPHIC VARIABLES
17	Middle East Current Psychiatry	2021	Assessing COVID19-related anxiety in an Egyptian sample and correlating it to knowledge and stigma about the virus
18	ACS Omega	2020	Chemocentric Informatics Analysis: Dexamethasone Versus Combination Therapy for COVID-19
19	Acta Pharm.	2021	Sitagliptin: a potential drug for the treatment of COVID-19
20	Patient Preference and Adherence	2020	COVID-19 Contact-Tracing Technology: Acceptability and Ethical Issues of Use
21	Journal of Nursing Education and Practice	2021	Developing and validating a nursing strategic plan for COVID-19 pandemic
22	Biochemical Pharmacology Volume	2020	Corrigendum to “Targeting Neprilysin (NEP) pathways: A potential new hope to defeat COVID-19 ghost
23	European Journal of Pharmacology	2020	New putative insights into neprilysin (NEP)-dependent pharmacotherapeutic role of roflumilast in treating COVID-19



24	Journal of School Nursing	2021	Predictors of Depression and Anxiety Among Senior High School Students During COVID-19 Pandemic: The Context of Home Quarantine and Online Education.
25	International Journal of Infectious Diseases	2021	The high prevalence of asymptomatic SARS-CoV-2 infection reveals the silent spread of COVID-19
26	Egyptian Journal of Health Care,	2021.	Fear of COVID-19 Pandemic, Obsessive-Compulsive Traits and Sleep Quality among First Academic Year Nursing Students, Alexandria University, Egypt
27	JOURNAL OF CLINICAL PERIODONTOLOGY	2021	Association between periodontitis and severity of COVID-19 infection: A case–control study
28	Tourism and Hospitality Research	2021	A content analysis for government’s and hotels’ response to COVID-19 pandemic in Egypt
29	Tourism Management	2021	Tourism Management The COVID-19 pandemic: The mitigating role of government and hotel support of hotel employees in Egypt
30	Journal of Essential Oil Research.	2021.	The use of aromatic plants and their therapeutic potential as antiviral agents: A hope for finding anti-COVID 19 essential oils,
31-32	Int. J. Environ. Res. Public Health	2021 2021	31-Effects of COVID-19 Lockdown on Physical Activity, Sedentary Behavior, and Satisfaction with Life in Qatar: A Preliminary Study 32- Continent-Wide Analysis of COVID 19: Total Cases, Deaths, Tests, Socio-Economic, and Morbidity Factors Associated to the Mortality Rate, and Forecasting Analysis in 2020–2021



33-35	Sustainability	2021 2021 2020	33- Impact of COVID-19 on Food Behavior and Consumption in Qatar 34- Impact of the COVID-19 Pandemic on Electricity Demand and Load Forecasting 35-. "Coronavirus and Halal Tourism and Hospitality Industry: Is It a Journey to the Unknown?"
36-37	International Journal of Innovation, Creativity and Change	2021 2021	36-Exploring the Social Psychology Responses among the Female Practice of Body pump during the Coronavirus Epidemic 37- The Stress and Optimism Levels among Professional Football and Basketball Players during the COVID-19 Pandemic
38	Physical Activity Review	2021	Effect of the Leisure Activities on the Level of Psychological stress among the elderly during the Coronavirus Outbreak
39	Technology in Society	2020	Distance education as a response to pandemics: Coronavirus and Arab culture
40	Environmental Monitoring and Assessment	2021	Assessment of water and sanitation systems at Palestinian healthcare facilities: pre- and post-COVID-19. Environ Monit Assess 193, 41 (2021).
41	Journal of Library & Information Services in Distance Learning	2021	Utilization of Online Learning Platforms by LIS Arab Faculty Members during the Coronavirus Outbreak,
42	Pharmaceuticals	2021	Repurposing of Some Natural Product Isolates as SARS-COV-2 Main Protease Inhibitors via In Vitro Cell Free and Cell-Based Antiviral Assessments and Molecular Modeling Approaches.
43	Depression Research and Treatment	2020	Prevalence and Predictors of Depression, Anxiety, and Stress among Youth at the Time

			of COVID-19: An Online Cross-Sectional Multicountry Study
44	Wiadomości Lekarskie, VOLUME	2020	IMPACT OF PANDEMIC COVID-19 ON THE LEGAL REGULATION OF WORLD TRADE ACTIVITY USING THE EXAMPLE OF THE MEDICAL SUPPLIES
45	BMC Nephrology	2021	Age and multimorbidities as poor prognostic factors for COVID-19 in hemodialysis: a Lebanese national study
46	Education and Information Technologies	2020	Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic
47	Asian Education and Development Studies	2020	The effect of online learning on communication between instructors and students during Covid-19 pandemic
48	European Journal of Pharmaceutical Sciences	2021	Importance of glutamine 189 flexibility in SARS-CoV-2 main protease: Lesson learned from in silico virtual screening of ChEMBL database and molecular dynamics
49	Front. Vet. Sci.	2020	The Impact of COVID-19 Pandemic on the Academic Performance of Veterinary Medical Students
50	Virology	2021	Repurposing of renin inhibitors as SARS-COV-2 main protease inhibitors: A computational study
51	International Journal of General Medicine	2021	Acute Lower Limb Ischemia in Patients Infected with COVID-19
52	Annals of Medicine and Surgery	2020	Prevalence of positive COVID-19 among asymptomatic health care workers who care patients infected with the novel coronavirus: A retrospective study

53	Technological Forecasting & Social Change	2021	Manufacturing and service supply chain resilience to the COVID-19 outbreak: Lessons learned from the automobile and airline industries
54	Global Journal of Infectious Diseases and Clinical Research	2020	The effects of immutonic capsule on CD4 T-Lymphocytes cells count: A case report
55	Computers & Electrical Engineering,	2020	Corona COVID-19 spread - a nonlinear modeling and simulation
56	Computers in Biology and Medicine	2021	Targeting multiple conformations of SARS-CoV2 Papain-Like Protease for drug repositioning: An in-silico study
57	Front. Chem.,	2020	Supporting SARS-CoV-2 Papain-Like Protease Drug Discovery: In silico Methods and Benchmarking
58	International Journal of Psychosocial Rehabilitation,	2020	Spillover of COVID-19: Impact on Stock Market Volatility
59	International Journal of Economics and Business Administration	2020	The Impact of COVID-19 on Gold Price Volatility
60	Information Development	2020	Health Information behavior during COVID-19 outbreak among Egyptian library and information science undergraduate students
61	The Journal of Headache and Pain	2020	Impact of coronavirus disease 2019 (COVID19) pandemic on patients with migraine: a web-based survey study
62	International Medical Journal	2020	COVID-19 Knowledge, Attitude, and Perception of COVID-19 among University Students: A Cross-Sectional Study
63	Educational Philosophy and Theory	2020	Covid-19 and the decolonisation of education in Palestinian universities



64	Multilingua	2021	Laboring to communicate: Use of migrant languages in COVID-19 awareness campaign in Qatar,
65	American Journal of Economics	2020,	Foresight of Coronavirus (COVID-19) Opportunities for a Better World
66	Computers, Materials & Continua	2021	Approach for Training Quantum Neural Network to Predict Severity of COVID-19 in Patients
67	Technology, Pedagogy and Education	2021	The Covid-19 epidemic: teachers' responses to school closure in developing countries
68	Patient Preference and Adherence	2020	COVID-19 Contact-Tracing Technology: Acceptability and Ethical Issues of Use
69	Journal of Orthopaedic Research and Surgery	2021	Sports Industry Post- COVID Century
70	SLAS Discovery	2020	Based on Principles and Insights of COVID-19 Epidemiology, Genome Sequencing, and Pathogenesis: Retrospective Analysis of Sinigrin and Prolixin RX (Fluphenazine) Provides Off-Label Drug Candidates

Several key contributions on online education such as:

Foreign Languages E-Learning: Challenges, Obstacles, and Behaviors during COVID-19 Pandemic based on teachers' perspectives and experience in Jordan. Emergency Online Learning in Low-Resource Settings: Effective Student Engagement Strategies the COVID-19 pandemic forced teachers and students into a sudden transition to emergency online education without prior preparation or guidelines. The results from this study can inform instructors, instructional designers, and system designers who need to design, teach, and support emergency online learning in low-resource contexts. Utilization of Online Learning Platforms by library and information Arab Faculty Members during the Coronavirus Outbreak.

Exploring the critical challenges and factors influencing the E-learning system usage during the COVID-19 pandemic that affect the usage of e-learning systems and should universities take them into the future plans such as technological factors, e-learning system quality factors, cultural aspects, self-efficacy factors, and trust factors. In addition, to main challenges that delay or prevent the usage of e-learning systems, namely change management issues, e-



learning system technical issues, and financial support issues. The effect of online learning on communication between instructors and students during the Covid-19 pandemic. Results revealed that Students still prefer Classroom classes over online classes due to many problems they face when taking online classes, such as lack of motivation, understanding of the material, and decrease in communication levels between the students and their instructors, and their feeling of isolation caused by online classes. The Covid-19 epidemic: teachers' responses to school closure in developing countries. It focuses on how teachers from Afghanistan, Libya, and Palestine participated in the study in middle school responded to school closure to fight the spread of Covid-19. The study found that teachers developed their skills to use emerging technologies and design suitable digital content. Moreover, they built strong relationships with the local community to assume their responsibility in emergency remote learning (ERL) by establishing community centers for students from poor families. Other studies focused on the impact of COVID-19 Lockdown on physical activity, sedentary behavior, exploring the social psychology responses and level of psychological stress, prevalence, predictors of depression, anxiety, and stress, teachers' responses to school closure, distance education as a response to pandemics Challenges and Solutions, COVID-19 Vaccine hesitancy and resistance. Impact of the COVID-19 pandemic on hemodialysis patients and patients with migraine. The prevalence of positive COVID-19 among asymptomatic health care workers, health information behavior during COVID-19 multiple sclerosis and COVID-19 infection, the legal regulation of world trade and business activities, Spillover of COVID-19: impact on the stock market and gold price volatility manufacturing and service supply chain resilience electricity demand and medical supplies shortages COVID-19 spread - nonlinear modeling and simulation. Supporting SARS-CoV-2 Papain-Like Protease Drug Discovery: In silico Methods and Benchmarking, Sera Containing neutralizing antibodies collected from COVID-19-recovered patients as a probable therapy. Table 2. The application of Scopus site score 2020 analysis on the selected articles journals showed the top twenty site score journal of received articles were from Bahrain(n=2), Egypt(n=4), Lebanon(n=2), Jordan (n=4), Qatar (n=4), Saudi Arabia(n=1), and the United Arab Emirates(n=3) table 2 the site score range between 16.5 to 1.1

Table 2: List of the top 20 Cite Score Scopus 2020 journals where Arab universities COVID-19 Pandemic research were published in 2020 &2021

Rank	Research Title	Year of publication	Journal name	Scopus Cite Score 2020
1	The COVID-19 pandemic: The mitigating role of government and hotel support of hotel employees in Egypt	2021	Tourism Management	16.5
2	Corrigendum to “Targeting Nephrylsin (NEP) pathways: A potential new hope to defeat COVID-19 ghost	2020	Biochemical Pharmacology	8.4
3	Importance of glutamine 189 flexibility in SARS-CoV-2 main protease: Lesson learned from in silico virtual screening of ChEMBL database and molecular dynamics	2021	European Journal of Pharmaceutical Sciences	7.8
4	The high prevalence of asymptomatic SARS-CoV-2 infection reveals the silent spread of COVID-19	2021	International Journal of Infectious Diseases	7.0
5	Repurposing of renin inhibitors as SARS-COV-2 main protease inhibitors: A computational study	2021	Virology	6.2
6	Prevalence and Potential Determinants of COVID-19 Vaccine Hesitancy and Resistance in Qatar: Results from a Nationally Representative Survey of Qatari Nationals and Migrants between December 2020 and January 2021	2021	Vaccines	5.6
7	The dynamic association between COVID-19 and chronic disorders: An updated insight into prevalence, mechanisms and therapeutic modalities	2021	Infection, Genetics, and Evolution	5.2
8	Distance education as a response to pandemics: Coronavirus and Arab culture	2020	Technology in Society	4.2
9	Impact of COVID-19 on Food Behavior and Consumption in Qatar	2020	Sustainability	3.9



10	Coronavirus and Halal Tourism and Hospitality Industry: Is It a Journey to the Unknown?	2020	Sustainability	3.9
11	Impact of the COVID-19 Pandemic on Electricity Demand and Load Forecasting	2021	Sustainability	3.9
12	Chemocentric Informatics Analysis: Dexamethasone Versus Combination Therapy for COVID-19	2020	ACS Omega	3.9
13	Effects of COVID-19 Lockdown on Physical Activity, Sedentary Behavior, and Satisfaction with Life in Qatar: A Preliminary Study	2021	Int. J. Environ. Res. Public Health	3.4
14	Continent-Wide Analysis of COVID 19: Total Cases, Deaths, Tests, Socio-Economic, and Morbidity Factors Associated to the Mortality Rate, and Forecasting Analysis in 2020–2021	2021	Int. J. Environ. Res. Public Health	3.4
15	Age and multimorbidities as poor prognostic factors for COVID-19 in hemodialysis: a Lebanese national study	2021	BMC Nephrology	3.2
16	Emergency Online Learning in Low-Resource Settings: Effective Student Engagement Strategies	2021	Educ. Sci.	2.1
17	Effect of the Leisure Activities on the Level of Psychological stress among the elderly during the Coronavirus Outbreak	2021	Physical Activity Review,	2.1
18	The impact of COVID-19 on the surgical operations	2020	Annals of Medicine and Surgery	1.6



19	IMPACT OF ISLAMIC LAW & PSYCHOLOGICAL PROBLEMS CAUSED BY COVID19: ANALYTIC STUDY	2021	Journal of Legal, Ethical and Regulatory Issues.	1.1
20	EFFECTS OF COVID-19 PANDEMIC ON CONTRACTUAL RELATIONS	2021	Journal of Legal, Ethical and Regulatory Issues	1.1

Discussion

Despite the outbreak of the pandemic in early 2020 and the lockdown imposed by the COVID-19 crisis during the past two years, Arab universities researchers have contributed to the worldwide COVID-19 research efforts for the pandemic, in the areas of treatment, Spreading, prevention, and, from a large variety of disciplines including education, business, engineering and information technology, fundamental and applied science, social and behavioral sciences, public health, and much more in Preventive and control measures against COVID-19 in Arab countries and have demonstrated a sustained commitment to generating new knowledge, and dissemination and transfer of COVID-19 research-based knowledge into routine health practice. Several studies conducted in other countries have indicated high levels of COVID-19 impacts on universities (Yang, Chen, Chen, 2021) examined the College students' stress and health in the COVID-19 pandemic: The role of academic workload, separation from school, and fears of contagion relationships between Chinese college students' three critical stressors and two types of health in the COVID-19 pandemic context.

The COVID-19 pandemic has significantly impacted academic life in the United States (Deznabi, Motahar, Sarvghad, Fiterau, and Mahyar,2020) Financial difficulties were the most considerable toll on staff and undergraduate students, while productivity challenges were mostly expressed by faculty and graduate students. The current study showed the major research articles tackle the impact of COVID-19 on teaching and learning similarly a new UNESCO global survey (UNESCO, 2021) reveals the impact of COVID-19 on higher education attempts to assess the varying impact the pandemic had on higher education systems in terms of access, equity, and quality of teaching. The global survey was addressed to the 193 UNESCO Member States and 11 Associate Members. Sixty-five countries submitted responses, fifty-seven of which were used for the analysis that informed the report. The survey aimed at providing an evidence-based overview of the current situation of the higher education system at national and global levels. The results provide insights into how some countries were able to transform challenges, brought by the rapid digitalization of education, into opportunities through strong government support and international cooperation. The key findings for the various assessment dimensions were the mode of teaching and learning where the major impact of COVID-19 on teaching and learning is the increase in online education. The hybrid model



of teaching has become the most popular form similarly disrupting, suspension, and cancellation of research activities globally. The current study exposes the need for more comprehensive interdisciplinary, multi-institutional, and global research collaborations.

Conclusions

The present study examined the research publications of the researchers from Arab universities and was able to provide a comprehensive view of the knowledge, attitudes, and practices toward COVID-19. To the best of our knowledge, this is the first analysis study of the Arab universities' COVID-19 research outcomes and our findings suggest that they have an acceptable level of research productivity on COVID-19.

Recommendations

The author recommends that Arab researchers and universities improve their research outcomes and efforts are needed to encourage open data sharing and scientific collaboration and disseminate their COVID -19 research outcomes and implement their findings to move from evidence to practice to serve their communities and advance health practices to overcome the impacts of the COVID-19 pandemic,

Limitations

Sampling for the study was conducted via a convenience sample through a call for a prize application award allocated by the association of Arab universities (AArU) for research on COVID-19 and sent by email to 326 AArU members universities none member universities may not have been able to participate in the study.

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