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Comprehensive Review of Healthcare Workforce Challenges, Technological Solutions, And Training Programs

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Abstract

The healthcare workforce is under pressure from, among other things, workforce deficit, staff fatigue, and changes in demand for skills due to the changing technological environment. This review, therefore, reviews these workforce challenges and examines how AI, telemedicine technology, EHRs, and wearable technology can suggest some of the mentioned workforce pressures. Moreover, it evaluates the changing trends in healthcare training programs and explores the need to adopt new technologies for innovation. Healthcare organizations can take advantage of the right technological solutions and increase the medical staff's and patients' effectiveness through increased efficiency, education, and training. Based on the arguments made throughout this paper, the following suggestions are made for healthcare organizations, policymakers, and educators to prepare the workforce for future needs.

Keywords: *Healthcare Workforce, AI In Healthcare, Staff Shortages, Burnout, Telemedicine, Training Programs, EHR, Wearable Devices, Healthcare Technology, Workforce Development, Interdisciplinary Training, Healthcare Challenges.*

Introduction

Healthcare human capital is an indispensable institutional structure that delivers primary and critical medical services, supervises processes connected with patient care, and addresses expanding needs in the sphere of health. However, this workforce is yet to be confronted with some challenges that hinder the efficient provision of quality care. These pressures—stress, staff deficit, new IT environments, and the need for new competencies—are intensified by the globalization of the healthcare field. On the other side, AI technology, telemedicine, and e-health records are some of the technological opportunities that can help ease this pressure on healthcare staff to extend overall healthcare efficiency and positively impact on the healthcare processes. This means that training programs must also change in ways that enable healthcare professionals to understand how to make the most of new technologies. This review will analyze the difficulties in the healthcare area of work, discuss how technology can effectively counteract the challenges, and find out how training courses prepare the healthcare workforce for the future.

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RESULTS AND FINDINGS

In this section, the results obtained from the literature and the collected data are summarized, as well as the effects of workforce-related problems, the efficiency of the technological approaches, and the consequences of the plight of the various forms of training programs.

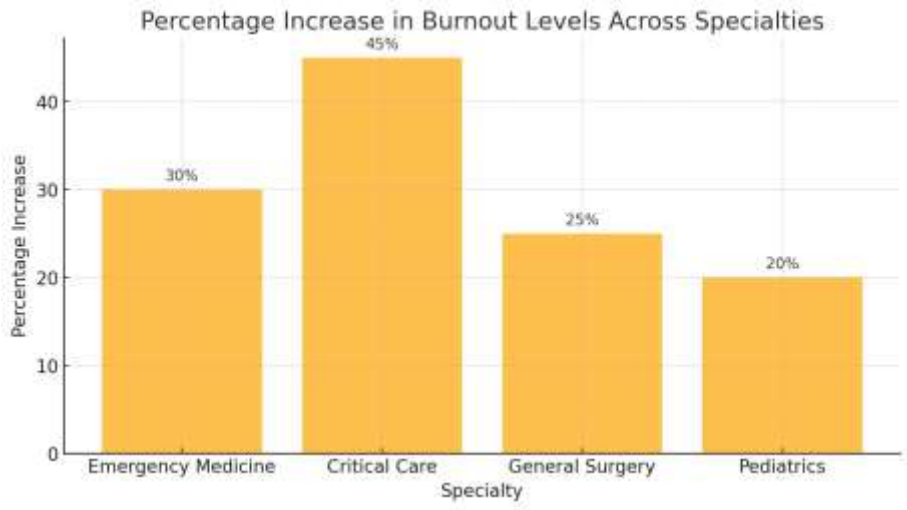
1. Effects of Workforce Issues

Key issues are present within the current healthcare workforce, primarily the shortage of staff, high staff turnover, and increasing burnout rates. Such challenges remarkably impact healthcare delivery, health consumers, and, more so, the providers' psychological health. The findings of the studies demonstrate that the attrition rates of healthcare staff, especially nurses and physicians, are unacceptably high, negatively impacting the healthcare workforce stability (Doleman et al., 2023; Mohammad et al., 2024a; Mohammad et al., 2023a; Mohammad et al, 2024b). For instance, in the United States, the turnover rate for registered nurses has been estimated to be around 18% and much higher in areas and specialties, including improving geriatrics and emergencies. Globally, there is variability, and countries within Sub-Saharan Africa and South Asia are critically short of healthcare professionals due to economic challenges, brain drain, and poor health education and training.

Another issue is the increasing rate of burnout among healthcare providers, which is another factor to be concerned about. Scientific data have shown that burnout levels have risen in various surgical fields: primary care, intensive care, emergency, and oncology (Rink et al., 2023). According to a survey carried out in 2021, 48% of America's emergency department physicians are burnt out, but the same is expected in European and Asian countries. For this reason, burnout has been on the rise for the following reasons: working long hours, being in a constant state of stress due to handling life-altering or threatening situations, and the COVID-19 pandemic. This problem is worsened by strains caused by a shortage of personnel in the organization's human resources, resulting in lower-quality performance, demoralization, truancy, and even early resignation or transition to a different profession (Maliwichi et al., 2024; Mohammad et al., 2023b; Al-Hawary et al., 2020; Al-Husban et al., 2023).

Table 1: Healthcare Worker Turnover Rates by Region

Region	Turnover Rate (%)
North America	18%
Europe	12%
Sub-Saharan Africa	30%
Southeast Asia	25%



Graph 1: Increase in Burnout Among Healthcare Workers by Specialty

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(Rink et al., 2020)

2. Effectiveness of Technological Solutions

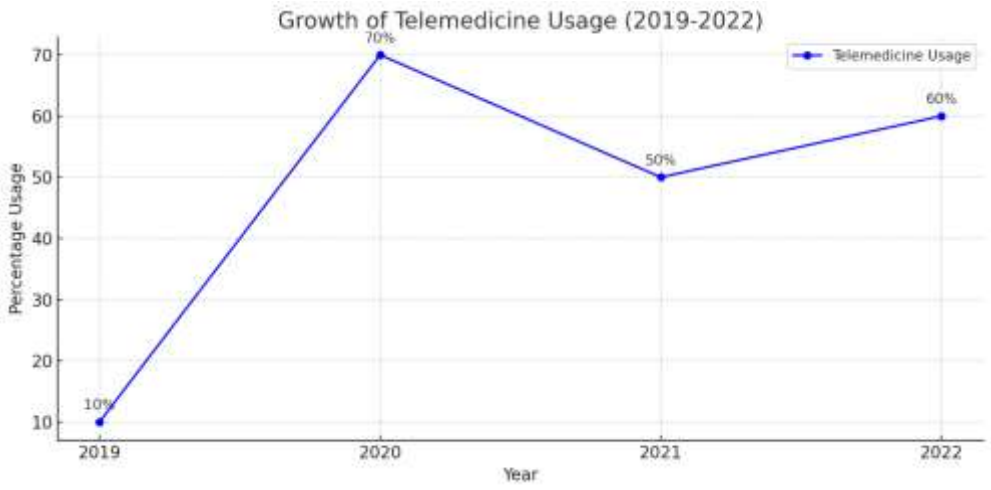
technologies have been realized as viable approaches to tackle healthcare workforce issues. Meaningful use of electronic health records (HEMR), telehealth, telemedicine, and AI tools has also gained much importance in recent years to make healthcare near perfect. Research findings clearly show that EHR systems can facilitate better clinical decision-making, lower the rate of medication mistakes, and advance patients' well-being by availing patient records and clinical data to workers in real time (Bokolo, 2020; Al-Nawafah et al., 2022; Alolayyan et al., 2018; Eldahamsheh, 2021). For instance, hospitals adopting EHR systems have observed improved medication safety; one study estimated a 30 per cent reduction in adverse drug events in hospitals with extensive EHR systems than in those that lack them.

Telemedicine, which has recently received extensive attention during the COVID-19 pandemic, can bring more access to healthcare services, especially in rural or other hard-to-reach areas. According to the U.S. Centers for Medicare & Medicaid Services (CMS), telehealth usage rose by 154% last year. This rise demonstrates that telemedicine can connect the existence of the geographical divide, lessen patient waiting time, and increase the possibility of tracking the patient by healthcare practitioners. In addition, telemedicine proved effective in lowering contact with frontline workers and getting patients previously seen to seek other avenues of care.

AI has also provided a positive implication and potential to support improving diagnostic capacities and reducing the burden on radiologists. Advanced technologies and analytics, for instance, in radiology, have been improved through AI to improve diagnosing on image scans. In more recent work, authors have used AI algorithms for real-time identification of lung cancer from CT scans with a performance level akin to 92 per cent (Monaghesh & Hajizadeh, 2020; Alzyoud et al., 2024; Mohammad et al., 2022; Rahamneh et al., 2023). At the same time, human radiologists accomplished the identical task at 88 per cent efficiency. Such advancements functionally enhance the ability to diagnose disease, simultaneously reducing the burden on assigned radiologists so they can spend more time on severe cases and patients.

Table 2: Comparison of EHR Adoption and Patient Outcomes

Outcome Measure	Before EHR Adoption	After EHR Adoption
Medication Errors	12%	8%
Patient Safety Events	15%	10%
Patient Satisfaction	75%	85%



Graph 2: Increase in Telemedicine Usage During COVID-19

(Monaghesh & Hajizadeh, 2020)

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graph showing the growth of telemedicine usage before, during, and after the COVID-19 pandemic, highlighting the sharp rise in telehealth appointments.)

3. Training Program Outcomes

There is a general agreement that training activities have taken center stage as the best bet in facing the deficits in skills and competency within healthcare human resources. Closely related to this is the emergence of new simulation technologies and virtual reality (VR) training applications that have improved training, especially in critical areas such as surgery or emergency care. Numerous research studies on simulation-based training reveal that its implementation enhances clinical judgment, procedural efficiency, and confidence of professional healthcare manpower. Research done on the effectiveness of simulation in training surgical residents reveals that there was a 25 per cent improvement in the simulation group's technical skills and a 15 per cent improvement in the patient outcome.

In addition, the emergence of virtual reality and augmented reality technologies in medical education has even enhanced training curriculum standards. For instance, VR systems in the training of junior doctors in surgical procedures enable the participants to rehearse time and again not only the mechanical component but also mental elements safely in a simulated context. An example of effective application of VR training is the training of neurosurgeons. The patients of this study included the residents who went through simulations of brain surgery in the virtual reality city and showed improved satisfaction rates for the training and improved agility and accuracy for their operations compared to conventional training techniques.

These training programs have succeeded in the operating room and gone further. Simulations have become evident in healthcare facilities as a method for teaching exercise in emergencies, handling patients, and communicating with them, which has enhanced healthcare systems.

Training Programs to Address Healthcare Workforce Needs

Current Training Gaps

Technological solutions exist for many of the healthcare workforce issues, but the extent to which technology is changing in the healthcare industry has also left a huge discrepancy in training. Healthcare practitioners have insufficient training in technology adoption, especially within small, remote, or developing countries where school experience could be insufficient. Additionally, traditional healthcare curricula often lack exhaustive training in new technologies like AI, telemedicine, and remote monitoring devices.

To close this gap, traditional healthcare training must be updated to focus on digital competency, telehealth, and artificial intelligence. Faculty of medicine and nursing must include these technologies in curricula to equip students for effective future practice. Other improvement strategies enable healthcare workers to capture continuing professional development (Enabling them to continue to learn and be up-to-date with modern technology.

Application to Simulation and Virtual Reality Training

Augmentation and virtual reality (VR) hold potential in healthcare training as they allow for learning professions within a risk-free environment. It means that information about interactions can be implemented in a safe environment, and complex attitudes can be trained without harming the patients: medical situations can be simulated. Training in VR is also more engaging because the trainee can touch the 3D model of a human body or virtually perform surgeries, which will help the trainee learn better and feel more confident.

Simulation-based training is more beneficial in such areas as surgery, emergency medicine, and other critical areas where there is much-required interaction. Using these technologies, such as VR and simulation, in delivering healthcare education can help institutions offer good training without using classes.

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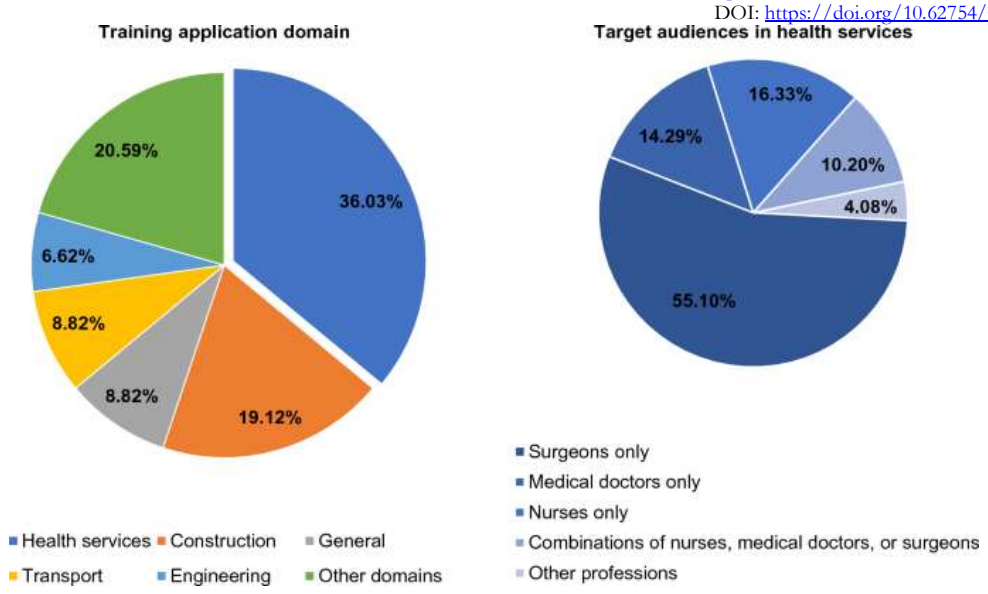

Interdisciplinary Training

The processes of providing health care are becoming more and more of a multiprofessional nature, and health care professionals are working increasingly in teams. Doctor-nurse, allied health, and technologist collaboratives or focused training for doctors, nurses, allied health professionals, and technology personnel are crucial requirements for training the workforce for the current type of healthcare settings. Such programs should include the values of teamwork, communication, and joint decision-making.

At the same time, there is a need for healthcare workers to be educated on how these technologies integrate into the existing care delivery models. This includes education on using employees' EHRs, telemedicine solutions, and AI technologies in common operations. Indeed, interdisciplinary training prepares patients for treatment cooperation, which improves the patients' outcomes and supplies health care resources more effectively

CONCLUSION

The Egyptian healthcare workforce is beset by several issues that affect both the quality of care and the healthcare workforce. Challenges like manpower shortage, early signs of burnout, and lack of training about advances in modern healthcare have thus posed significant challenges for the workforce to deliver as requisite by complex healthcare systems. These challenges are aggravated by the demanding tasks in dealing with patients, especially in the current demanding environment occasioned by the COVID-19 virus. Nonetheless, as exemplified throughout the study, contemporary technologies, including but not limited to artificial intelligence (AI), telemedicine, and wearable devices, present significant promise of lessening some of the demands on HC professionals.

AI has already touched some of the diagnostic processes that enhance precision in the diagnosis procedures without overburdening the radiologists, clinicians, and other health professionals. For instance, AI can diagnose cancer and other diseases efficiently and with a lower probability of diagnostic mistakes compared to previously existing methods (Pesheva, 2024; Al-Azzam et al., 2023; Al-Shormana et al., 2022; Al-E'wesat et al., 2024). Another type of artificial intelligence is used to predict patients' outcomes care planning, and chronic disease management; therefore, it can be considered the scope of applying AI in the healthcare industry as a predictor and objective tool. This shift increases the quality of the decisions made by healthcare practitioners, which, in effect, makes the process more efficient for healthcare facilities.

Telemedicine has been demonstrated to greatly enhance access to health care, especially for rural clientele. Teleconsultations and tele check-ups cut down on physical rendezvous, not only saving time and money for both the patient and the healthcare provider. This has been particularly relevant in the current COVID-

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19 situation, which has seen telemedicine as one of the tools for delivering health services and avoiding possible transmission of the virus. In addition, the application and practice of technology-advanced wearables have empowered continuous patient tracking with great potential for identifying new health complications affecting the patient in real time by constantly monitoring the patient's vital states. Using such technologies amalgamates the benefits of patient care, lightens the load from the side of health care professionals, leads to more attention being paid to seriously ill patients, and less time spent adjusting individuals not properly utilizing their monitoring services.

Besides these technologies, the upgrade of the training programs is essential to meet the needs of the adapting healthcare workers. Modern healthcare facilities need to develop ways to update the training of traditional medical education with new technologies, which include artificial intelligence, telemedicine, and data analysis. Education on digital literacy should be included in the competency of healthcare institutions and the incorporation of advanced technologies in the learning curriculum for healthcare students. Other learning technologies include the use of simulation and virtual reality training to improve the learning experience. These technologies give healthcare students and practitioners controlled practical training sessions that are immensely useful for honing their technical and decision-making capabilities.

However, as with many direct care professions, workforce training cannot only encompass skills-related tasks. In addition, promoting and supporting the clinical and psychological well-being of healthcare staff are also crucial necessities to eliminating burnout and reinforcing job satisfaction among such employees. Despite some improvement, burnout remains a problem, especially among employees who work under significant stress, including ER, ICUs, and oncology clinicians. Research has always pointed out that when healthcare workers are burnt out, they lower the quality of care, have higher turnover rates, and make more mistakes. Therefore, there is a need to have measures put in place to address burnout at healthcare facilities for efficiency in the delivery of services and care to the clients and patients involved.

There is a growing concern about increased diversity in healthcare organizations ' workforces to meet the diversity of the populations served. Diversity in the healthcare workforce can positively impact cultures and communication, the consequence being favorable results for underrepresented cultures within society. Diversity is key: diverse hiring strategies, positive role models, and support resources to make sure talented, diverse candidates whom the company can benefit from are not turned off by the company. Care is more appropriate and fairer to all patients when the healthcare workforce details an ethical mosaic.

RECOMMENDATIONS

1. Invest in Technology

Governments and health care should invest in AI, telemedicine, and electronic health records (EHR). None of these technologies are helpful in reducing inefficiency, delivering better patient care, and reducing the administrative load on the healthcare workforce. AI in diagnostics, in conjunction with predictive analytics, has the potential to increase the effectiveness of care delivered to patients since the healthcare range informs healthcare workers of sensible data (Alowais et al., 2023). However, telemedicine is also advantageous as a scalable solution to increase the amount of healthcare presented in the healthcare deficit or scarcity areas. Suppose further investment in these technologies has to be made. In that case, healthcare organizations can address the pressure that comes with the demand for increased services and require less money to spend for better patient results in the long run.

1. Enhance Training Programs

Medical education and training need to be modified to prepare the healthcare workforce for the challenges of responding to the changes in healthcare delivery. These competencies should be included in curricula and, where possible, include a brief on new technologies like artificial intelligence in patient care, telemedicine, and digital health technologies. Thus, enhanced training for healthcare workers should be made available, and continuous professional development should be provided since the worker should be proficient in technologies and methods. Virtual environment technology must also be allowed as a part of

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medical training, as it provides a great practice experience. This approach, in turn, will not only raise technical proficiency but also promote problem-solving and decision-making.

1. Address Burnout

Healthcare systems should follow the given approaches to counter fatigue among their employees: This entails flexible working hours to enhance work-life balance, proper staff importance to implement a work schedule that is sensible, practical, and realistic, and recognition of the healthcare employees. Stressing management and counselling services should also be accorded to the existing healthcare workers (Mitra et al., 2024). Promoting mental health awareness and advocacy within any healthcare setting will gradually bring down the concealed mentality of healthcare professionals of 'no mental health problem is a personal problem' to allow them to seek healthcare services. Avoiding burnout is highly important in ensuring that healthcare workers remain productive performers of their duties and deliver quality services.

1. Promote Workforce Diversity

As for the second recommendation, healthcare organizations must organize disabled people and minority groups, and this can be done by providing a good example during the hiring process and offering development programs for young people who need support. Such diversity can help patients express themselves to healthcare professionals and providers and help providers or leaders gain more cultural sensitivity, thus resulting in the fair provision of healthcare services (Reynolds, 2024). A healthcare system should proactively seek talented people from underrepresented categories and career advancement possibilities. Also, understanding and promoting a diverse workplace culture will make talented and qualified people stay in the workplace, promising healthcare innovations (Halpin, 2024).

To address the challenges experienced in the healthcare system workforce, the following strategies should be enhanced: technological devices used in training programs, ways of addressing burnout, and diversity. Suppose these recommendations are integrated into the health systems. In that case, the health care organizations wiorganizationsable to address the challenges affecting the health of America's working generation while improving patient outcomes and making health systems sustainable.

References

Advancements in Telehealth and Its Impact on Public Health – James Lind Institute | Public Health School in Switzerland. (n.d.). https://jliedu.ch/advancements-in-telehealth-and-its-impact-on-public-health/

Al-Azzam, M. A. R., Alrfai, M. M., Al-Hawary, S. I. S., Mohammad, A. A. S., Al-Adamat, A. M., Mohammad, L. S., Al-hourani, L. (2023). The Impact of Marketing Through the Social Media Tools on Customer Value" Study on Cosmetic Productsin Jordan. In Emerging Trends and Innovation in Business and Finance (pp. 183-196). Singapore: Springer Nature Singapore.

Al-E'wesat, M.S., Hunitie, M.F., Al sarayreh, A., Alserhan, A.F., Al-Ayed, S.I., Al-Tit, A.A., Mohammad. A.A., Al-hawajreh, K.M., Al-Hawary, S.I.S., Alqahtani, M.M. (2024). Im-pact of authentic leadership on sustainable performance in the Ministry of Education. In: Hannoon, A., and Mahmood, A. (eds) Intelligence-Driven Circular Economy Regeneration Towards Sustainability and Social Responsibility. Studies in Computational Intelligence. Springer, Cham. Forthcoming.

Al-Hawary, S. I. S., Mohammad, A. S., Al-Syasneh, M. S., Qandah, M. S. F., Alhajri, T. M. S. (2020). Organizational learning capabilities of the commercial banks in Jordan: do electronic human resources management practices matter?. International Journal of Learning and Intellectual Capital, 17(3), 242-266. https://doi.org/10.1504/IJLIC.2020.109927

Al-Husban, D. A. A. O., Al-Adamat, A. M., Haija, A. A. A., Al Sheyab, H. M., Aldai-hani, F. M. F., Al-Hawary, S. I. S., Mohammad, A. A. S. (2023). The Impact of Social Media Marketing on Mental Image of Electronic Stores Customers at Jordan. In Emerging Trends and Innovation in Business And Finance (pp. 89-103). Singa-pore: Springer Nature Singapore. https://doi.org/10.1007/978-981-99-6101-6_7

Al-Nawafah, S., Al-Shorman, H., Aityassine, F., Khrisat, F., Hunitie, M., Mohammad, A., Al-Hawary, S. (2022). The effect of supply chain management through social media on competitiveness of the private hospitals in Jordan. Uncertain Supply Chain Management, 10(3), 737-746. http://dx.doi.org/10.5267/j.uscm.2022.5.001

Alolayyan, M.., Al-Hawary, S. I.., Mohammad, A. A., Al-Nady, B. A. (2018). Banking Service Quality Provided by Commercial Banks and Customer Satisfaction. A structural Equation Modelling Approaches. International Journal of Productivity and Quality Management, 24(4), 543–565. https://doi.org/10.1504/IJPQM.2018.093454

Alowais, S. A., Alghamdi, S. S., Alsuhebany, N., Alqahtani, T., Alshaya, A. I., Almohareb, S. N., Aldairem, A., Alrashed, M., Saleh, K. B., Badreldin, H. A., Yami, M. S. A., Harbi, S. A., & Albekairy, A. M. (2023). Revolutionizing healthcare:

the role of artificial intelligence in clinical practice. BMC Medical Education, 23(1). https://doi.org/10.1186/s12909-023-04698-z

Al-Shormana, H., AL-Zyadat, A., Khalayleh , M., Al- Quran, A. Z., Alhalalmeh, M. I., Mohammad, A., Al-Hawary, S. (2022). Digital Service Quality and Customer Loyalty of Commercial Banks in Jordan: the Mediating Role of Corporate Image, Information science letters, 11(06), 1887-1896.

Alzyoud, M., Hunitie, M.F., Alka'awneh, S.M., Samara, E.I., Bani Salameh, W.M., Abu Haija, A.A., Al-shanableh, N., Mohammad, A.A., Al-Momani, A., Al-Hawary, S.I.S. (2024). Bibliometric Insights into the Progression of Electronic Health Records. In: Hannoon, A., and Mahmood, A. (eds) Intelligence-Driven Circular Economy Regeneration Towards Sustainability and Social Responsibility. Studies in Computational Intelligence. Springer, Cham. Forthcoming.

Bokolo, A. J. (2020). Application of telemedicine and eHealth technology for clinical services in response to COVID-19 pandemic. Health and Technology, 11(2), 359–366. https://doi.org/10.1007/s12553-020-00516-4

Doleman, G., De Leo, A., & Bloxsome, D. (2020). The impact of pandemics on healthcare providers' workloads: A scoping review. Journal of Advanced Nursing, 79(12), 4434–4454. https://doi.org/10.1111/jan.15690

Eldahamsheh, M.M., Almomani, H.M., Bani-Khaled, A.K.,Al-Quran, A.Z., Al-Hawary, S.I.S& Mohammad, A.A (2021). Factors Affecting Digital Marketing Success in Jordan . International Journal of Entrepreneurship , 25(S5), 1-12.

Halpin, M. (2019, October 4). The Application of Diversity and Inclusion Practices in Healthcare. Recite Me. https://reciteme.com/news/diversity-and-inclusion-in-healthcare/

Humansmart.com.mx. (n.d.). What are the benefits of implementing flexible working hours to manage fatigue and stress? https://humansmart.com.mx/en/blogs/blog-what-are-the-benefits-of-implementing-flexible-working-hours-to-manage-fatigue-and-stress-56558

Maliwichi, L., Kondowe, F., Mmanga, C., Mchenga, M., Kainja, J., Nyamali, S., & Ndasauka, Y. (2016). The mental health toll among healthcare workers during the COVID-19 Pandemic in Malawi. Scientific Reports, 14(1). https://doi.org/10.1038/s41598-024-61216-x

Mitra, L. G., Sharma, J., & Walia, H. S. (2017). Improving Work–life Balance and Satisfaction to Improve Patient Care. Indian Journal of Critical Care Medicine, 28(4), 326–328. https://doi.org/10.5005/jp-journals-10071-24689

Mohammad, A. A. S., Alolayyan, M. N., Al-Daoud, K. I., Al Nammas, Y. M., Vasudevan, A., & Mohammad, S. I. (2024a). Association between Social Demographic Factors and Health Literacy in Jordan. Journal of Ecohumanism, 3(7), 2351-2365.

Mohammad, A. A. S., Al-Qasem, M. M., Khodeer, S. M. D. T., Aldaihani, F. M. F., Alserhan, A. F., Haija, A. A. A., ... & Al-Hawary, S. I. S. (2023b). Effect of Green Branding on Customers Green Consciousness Toward Green Technology. In Emerging Trends and Innovation in Business and Finance (pp. 35-48). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-99-6101-6_3

Mohammad, A. A. S., Barghouth, M. Y., Al-Husban, N. A., Aldaihani, F. M. F., Al-Husban, D. A. A. O., Lemoun, A. A. A., ... & Al-Hawary, S. I. S. (2023a). Does Social Media Marketing Affect Marketing Performance. In Emerging Trends and Innovation in Business and Finance (pp. 21-34). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-99-6101-6_2

Mohammad, A. A. S., Khanfar, I. A., Al Oraini, B., Vasudevan, A., Mohammad, S. I., & Fei, Z. (2024b). Predictive analytics on artificial intelligence in supply chain optimization. Data and Metadata, 3, 395-395.

Mohammad, A., Aldmour, R., Al-Hawary, S. (2022). Drivers of online food delivery orientation. International Journal of Data and Network Science, 6(4), 1619-1624. http://dx.doi.org/10.5267/j.ijdns.2022.4.016

Monaghesh, E., & Hajizadeh, A. (2020). The role of telehealth during COVID-19 outbreak: a systematic review based on current evidence. BMC Public Health, 20(1). https://doi.org/10.1186/s12889-020-09301-4

Pesheva, B. E. (2016, April 5). Does AI Help or Hurt Human Radiologists' Performance? It Depends on the Doctor. Harvard Medical School. https://hms.harvard.edu/news/does-ai-help-or-hurt-human-radiologists-performance-depends-doctor

Rahamneh, A., Alrawashdeh, S., Bawaneh, A., Alatyat, Z., Mohammad, A., Al-Hawary, S. (2023). The effect of digital supply chain on lean manufacturing: A structural equation modelling approach. Uncertain Supply Chain Management, 11(1), 391-402. http://dx.doi.org/10.5267/j.uscm.2022.9.003

Reynolds, K. (2018, June 11). 13 benefits and challenges of cultural diversity in the workplace. Hult International Business School. https://www.hult.edu/blog/benefits-challenges-cultural-diversity-workplace/

Rink, L. C., Oyesanya, T. O., Adair, K. C., Humphreys, J. C., Silva, S. G., & Sexton, J. B. (2020). Stressors Among Healthcare Workers: A Summative Content Analysis. Global Qualitative Nursing Research, 10, 233339362311611. https://doi.org/10.1177/23333936231161127