Available online freely at www.isisn.org

Bioscience Research

Print ISSN: 1811-9506 Online ISSN: 2218-3973

Journal by Innovative Scientific Information & Services Network

RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2022 19(4): 2030-2039. **OPEN ACCESS**

Impact of COVID-19 pandemic on Teaching, Learning and assessment in higher education in Saudi Arabia; Challenges and opportunities

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Digital technology assisted learning and assessment has been proven as alternative to traditional educational methods. Global crisis as COVID-19 pandemic has demonstrated the importance of conversion from face-to-face to online teaching. Online learning solves the problems of education facing those who were previously unable to do, due to geographical distribution or working. Online assessment offers better assessment, flexibility, long-term time savings; immediate response to learners, consistent and standardized cost-effective and learners can be assessed fairly. When the COVID-19 outbreak forced people to stay at home, e-learning allowed them to keep their lessons going using Zoom, WhatsApp, Google Meet, Youtube Live, Telegram, Skype, etc. applications. Technological skills and knowledge are critical for tutors in today's world. Online assessment has no detrimental impact on learner success, and the advantages of online assessment are suitable and familiar by students. Online classes are not new in the Kingdom of Saudi Arabia. Learning at King Abdulaziz University (KAU) in Jeddah was shifted from traditional classrooms to Blackboard®, an online Learning Management System (LMS) with both synchronous and asynchronous components. Also, in the College of Medicine at Qassim University, they conducted educational sessions and formative assessment through official online platforms, mainly through the Blackboard learning management system (LMS). So, marvelous steps towards E- learning and assessment have been established forced by the COVID-19 pandemic. However, more studies are required for better delineation of benefits and shortcomings of online education.

Keywords: Pandemic-COVID-19-Teaching-Learning-Assessment-Universities-Challenges

INTRODUCTION

The COVID-19 pandemic which considered as global crisis had huge effects on all sectors of society and almost paralyzed the whole world, including economy, business, trading, tourism, industry, transportation, working, travel, bank and financial services. It also had impact on people's habits, politic, socioeconomic, and education. Higher education could not be excluded. This conversion from face-to-face to online teaching was abrupt and unanticipated. So, challenges and opportunities have to be considered in teaching and learning in various fields. In other words, "this is a huge stress experiment for education systems, as well as it is opportunity to improve alternative education chances" (Co-operation and Development, 2020).

E-learning before COVID-19 pandemic

The use of digital technology for educational purposes is rapidly expanding. E-learning has been defined as "an educational method that facilitates learning by the application of information technology and communication providing an opportunity for learners to have access to all the required education programs" (Golband et al. 2014).

Education is transmitted either by face-to-face or online manner with the aid of technology. If 80% of the course is delivered online, it is considered an online course (Allen and Seaman, 2015). The online system could be synchronous or asynchronous. It is synchronous if both teacher and students are present at the same time and place having direct, concomitant contact. On the other hand, if both are not present simultaneously at the same time and place, it is defined as asynchronous course (Glass, 2017). Therefore, the universities provide their courses either by online or face-to-face way.

Online learning refers is described when (1) the student is a way from the tutor/instructor, (2) any type of technology is used by the student to get access to the learning resources, (3) the technology is used by the student u to interrelate with the teacher and with other colleagues and (4) some kind of support is provided to learners . The way of learning and teaching through an online manner is similar to that in any other official

educational environment . A variety of tools, educational materials, educational approaches, roles, organizational arrangements and forms of interaction, monitoring and support are involved through online learning and teaching with possible mixtures of substitution and combination (Bates and Poole, 2003, Bullen and Janes, 2006, Bach et al. 2006). The capability of shifting the time and place of the tutorial interaction using those wealth of educational options, emerges as a valuable source of versatility .

Online learning solves the problems of education facing those who were previously unable to do, due to geographical distribution or working. "Online learning" is defined as any form of learning and teaching that delivered synchronously or asynchronously in a virtual environment (e.g. via Blackboard, Moodle, etc.). It could include contact between students, instructors, their colleagues, educational resources and activities (Mubarak et al. 2020). Online course delivery is a cost-effective and easy way to provide the educational program to students in rural and distant areas. To address the problem, institutions have implemented a number of novel strategies, including using software/apps like Google Classroom, Zoom, and Microsoft Teams to deliver online lessons (Agarwal and Kaushik, 2020). Online learning has become one of the most quickly growing fields of educational technology as a result of the fast rise of internet use (Bates, 2019). Online learning is also becoming increasingly popular. Many studies have sought to identify the characteristics that contribute to the success or failure of online learning, as well as the critical components that impact student satisfaction in an online learning environment (Weidlich and Bastiaens, 2018). E-readiness is an important factor to consider in the design and structure of e-learning in order for distant education to be effective for students to succeed (Kaur and Zoraini Wati, 2004). "Being psychologically and mentally prepared for the experience of e-learning" is how e-learning preparedness is characterized (Borotis et al. 2008). The capacity to perceive possibilities that allow for the use of electronic resources such as the internet is known as online readiness (Choucri et al. 2003).

Online assessment offers for improved assessment, flexibility, long-term time savings, and allows immediate response to learners, generates consistent and standardized assessment, progress can be tracked, assessment activities can be documented, it is cost-effective, and learners can be assessed equitably (Booth et al. 2003).

Students and the setting of each institute should be suited to the design of e-learning (Khlaisang and Koraneekij, 2018, Guo et al. 2015, Christensen and Eyring, 2012). Measurement and assessment, a key component in learning that results in a successful learning process, has been identified as a barrier of online training (Khlaisang and Likhitdamrongkiat, 2015). Measurement should be upgraded to encompass both traditional and genuine assessment in order to fulfil the educational demands of digital learners and the direction of international education, which is focused on generating innovators. It should concentrate on comprehensive knowledge, attitude, and skill assessments. For the greatest advantage of the measurement, there should be public venues for instructors who teach related subjects to exchange, share, amend, and expand the evaluation form in keeping with the principle of open learning and open content (Khlaisang and Koraneekij, 2019).

E-assessment is a complicated process in which numerous elements must be considered, such as student learning styles, technological consequences, adaptive educational material, learning and knowledge management, feedback, motivation, and so on. According to Kendle and Northcote, assessment should be one of the first design considerations when creating an online course, including it into the programme and not being considered separately (Booth et al. 2003).

Impact of COVID-19 pandemic on E- Assessment

Online exams have a common problem in form of security concerns (Barthel, 2016, Butler-Henderson and Crawford, 2020, Dadashzadeh, 2021). This damages the credibility of training programs and lowers the perceived significance of diplomas among potential employers (Dadashzadeh, 2021, Carrell et al. 2008). Security-enhanced online assessment systems are used as a method to prevent fraud and cheating (Foster and Layman, 2013, Slusky, 2020, Tomasi et al. 2009). Secure online assessment systems are constantly evolving in tandem with advances in ICT, such as artificial intelligence integration, data analysis using image processing, data mining techniques, internet use, and network infrastructure development. To prevent and/or identify cheating, these systems use a variety of ways (Topuz et al. 2022). Ryu et al (Ryu et al. 2020) have stated that single-factor verification was substituted by a multimodal biometric system in online evaluation systems and developed a multibiometric system that employs facial recognition and keystroke dynamics for continuous verification. Arnò et al (Arnò et al. 2021) performed two case studies in which they analyzed the aspects of existing commercial online assessment systems and recommended constructing an automatic surveillance system for online assessments that conducts continuous facial recognition while still allowing manual monitoring. Li et al (Li et al. 2021) proposed a system for administering an online test that concurrently transmitted questions to students and worked on optimization, with positive results. Choosing/developing an online assessment system has become tough for individuals who would like to select/develop an online assessment system because of many such qualities of online assessment systems.

E- Learning during COVID-19 pandemic

The compelled and unexpected transition to online teaching is seen as a watershed moment for changing

education (especially higher education) and encouraging innovation, with the need to factor in fairness and social justice, as well as educators' and institutions' readiness and conditions for operating in various learning and teaching environments (Assunção Flores and Gago, 2020). Whereas, scholars working at universities, who were at the forefront of such developments, were subjected to great pressure and disruption in their practices and professional duties (Watermeyer et al. 2021). This sudden transition was particularly difficult and challenging for individuals who lacked the necessary expertise or experience for effective online teaching (Rapanta et al. 2020).

The worldwide lockdowns and quarantining of millions have rendered the whole educational system (Islam et al. 2021). According to UNESCO (O'Hagan, 2020) globally, In 191 countries, the tremendous disruption produced by the COVID-19 epidemic has impacted at least 1.5 billion children and 63 million primary and secondary instructors. For an extended period of time, students from all around the world have been trapped. In order to avoid community transmissions of the virus, in-person classes in universities, colleges, and schools were deferred (Islam et al. 2021). The exponential rise of emergency remote teaching, a diluted type of e-learning (Hodges et al. 2020), has turned into a key element of the new-normal reality, a rescuer, following the outbreak of the COVID-19 epidemic. Online classes have been offered by institutions with the necessary technical skills. When the COVID-19 outbreak forced people to stay at home, e-learning allowed them to keep their lessons going since it allowed them to work around space and time constraints. As a result, students were able to effortlessly engage in lectures, tests, discussions, course work and other activities anyplace and at any time (Khan, 2003). This prevented them from wasting crucial semester time and hence possible financial catastrophe for both students and institutions was saved (Islam et al. 2021).

A global rush of universities to transfer their courses online to maintain continuity in student teaching and learning due to COVID-19 break out, according to Seetal, Gunness, and Teeroovengadum (Seetal et al. 2021) who found academics' uneven familiarity with technology and the need for self-development with technological support during disasters, as well as a need for more leadership to deal with difficult situations to be significant. a recent Portuguese study stated that limited substructure and incomes, a lack of funding opportunities, inadequate technological capapbilitis, a conservative academic principles and a deficiency of technical support were the main obstacles to digital revolution in higher education institutions (Vicente et al. 2020). Moreover, other studies carried out in Portugal also concluded that students expressed worries about not being able to finish the academic year, the stress caused by the shift in teaching techniques(Xavier et al. 2020) and the nonexistence of face-to-face laboratory and practical lessons (Gonçalves et al. 2020). According to Teras et al (Teräs et al. 2020) many institutions have failed to select the best technology for providing the educational materials to students.

According to Cruickshank (2020), the transition to online courses may be challenging since face-to-face and virtual classrooms are not the same. Many schools and universities in the United States have turned to online learning to replace traditional face-to-face classroom instruction (Abdalla, 2020, Pfleger, 2020), but this is not an easy process because many faculty members are unfamiliar with educational technology. Furthermore, according to Pfleger, many students lacked access to fast and trustworthy Internet services.(Pfleger, 2020).

During the COVID-19 epidemic in Spain, the INTEF, Procomn, and Educlan platforms were established. Procomn offers over 100,000 educational materials and learning objects; and Educlan is an online channel. INTEF comprises educational tools, resources, and apps available to families, instructors, and students themselves that support distant learning . Meanwhile, Moodle, a free and open-source learning management system, was offered as a resource for aiding teaching at the University of Deusto in Spain (Del Val et al. 2010). Furthermore, The university has used Google Meet to enable students and their professors to conduct video conferencing .

Impact of COVID-19 pandemic on E- Assessment

It is certain fact that exams are tremendously significant in achieving educational objectives (Brown et al. 2013, Fuchs and Fuchs, 1984). Because of the COVID-19 epidemic and the advancement of information and communication technologies (ICT), online examination applications have proliferated in recent years. Most exams, quizzes, tests, and many other measuring and assessment tools were migrated to online platforms during the Emergency Remote Teaching (ERT) era (Topuz et al. 2022).

The principle of ERT arose from the problem that occurred during the COVID-19 epidemic. Instead of a permanent solution, it contains workarounds. It attempts to build quick, practical, dependable, and adaptable answers to challenges, as opposed to scheduled distant education activities (Hodges et al. 2020). During the COVID-19 period, the requirement for secure online evaluation tools became even more apparent. As a result, online evaluation systems should include elements that can help solve difficulties throughout the ERT time (Topuz et al. 2022). The need for guidelines for the selection of online assessment tools has increased with the growing need for these tools throught the ERT period (Rahim, 2020).

Impact of COVID-19 pandemic in Saudi Arabia on E-Learning and E- Assessment during

The concept of online classes is not new in the Kingdom of Saudi Arabia. Due to the transition to online education, Al-Samiri investigated the advantages as well as disadvantages of the epidemic on tertiary level

teaching and learning. He assessed the challenges encountered by students and professors by reviewing research produced since the outbreak. Students' lack of motivation, technology concerns, an ineffective learning environment, and students' mental health were all identified as issues in the research. There were also some beneficial results, such as location and time versatility (Al-Samiri, 2021).

Daraghmeh et al. investigated the influence of the pandemic on K-12 English education in Saudi Arabia's MENA area. The research looked into the technological, institutional, and socio-cultural challenges that Khbrat English teacher graduates encounter. It has both beneficial and harmful effects, according to the findings (Daraghmeh et al. 2021). Davis et al. did research in Australia to better understand the difficulties of online teaching in social work education. The study illustrates the difficulties that teachers face in terms of course results, student retention, and active student involvement in classrooms. Academics must become aware of best practices in remote and online education and execute them with the best technological capabilities to tackle these problems (Davis et al. 2019).

During this emergency scenario, the institution had to provide educational services to staff and students during the spring semester. Teachers and students alike had no choice in this issue, and numerous adaptations were required to survive the pandemic era without fully suspending the educational process, including some changes to evaluation techniques. Despite the situation being far from ideal, “Saudi universities were naturally better prepared to transition to the online learning environment, as most Saudi universities had already implemented digital communication and learning tools” (Al-Samiri, 2021). The university's LMS, particularly Blackboard ®, had been utilised for paid or executive online courses with external or distant learning students in several faculties for several years previous to the pandemic, so faculty and staff were aware of it and some may have used it, but not everyone had the same experience or degree of understanding of it and its capabilities. “This software was not used extensively and served a supplementary role prior to the pandemic and its e-learning users are still discovering its features” (Al-Samiri, 2021).

Effect of COVID-19 on Students and teachers satisfaction with online teaching and assessment

Teachers’ satisfaction

One of the most crucial cornerstones in every educational system is teachers. The delivery of lessons and the usage of technologies in teachers' instructional teaching and learning are influenced by their knowledge and experience (Mishra and Mehta, 2017). Teachers must master the knowledge and abilities in terms of technology integration in order to successfully employ ICT in teaching and learning (Garba et al. 2015). Teachers play a critical role in ensuring that education continues to be successful. Teachers were anticipated to be able to use online learning systems quickly during the abrupt shift to online education (Zhang et al. 2020). However, lacking of knowledge and abilities in converting offline (hardcopy) materials to online (softcopy) materials and sharing them on online platforms was experienced by teachers. Due to a lack of expertise in online teaching, teachers lacked online teaching abilities. As a result, they had difficulty producing teaching materials that could accommodate students of all levels, devising appropriate approaches for all students, and planning synchronous classes. Effective lesson delivery depends on the capacity to integrate technology, material, and tutoring based on knowledge and abilities. Therefore , these skills and knowledge are critical for tutors in today's world (Izhar et al. 2021).

According to Koehler et al (Koehler and Mishra, 2009), technology pedagogy knowledge (TPK) refers to a teacher's ability to change the teaching and learning process in response to a new technology, whereas technology content knowledge (TCK) is defined as identifying the specific procedures that support the subject matter's teaching. Teacher retention, as well as their well-being, loyalty, and commitment, in addition to the advancement of the teaching profession's standing, are all tied to teacher satisfaction. Teacher satisfaction was linked to the institution's working circumstances (Toropova et al. 2021). Faculty satisfaction is crucial for a healthy and successful learning process. It's a mindset established as a result of a student's educational experience, facilities, and services being evaluated. Professor satisfaction is described as a feeling that online instruction is effective, competent, and beneficial to both students and professors (Kim and Park, 2021). The key aspects that determine online faculty satisfaction, according to Hixson's research, are their employment experience (i.e., demographics), online design tasks, initiatives, and methodologies. As a result, the goal of this study is to evaluate nursing faculty members' perceptions of online teaching preparation, obstacles, and satisfaction during the COVID-19 pandemic (Hixson, 2021).

Chen and Liu focused on online teaching faculty's self-evaluation of their course designs. They used weekly discussion postings and end-of-semester oral assessments to illustrate two forms of self-assessment in the study. Academics conducted a self-evaluation and altered their courses and activities as a result. Student performance increased once the curriculum and activities were redesigned (Chen and Liu, 2018).

Another study has shown that instructors spend as much as one-third to half of their time on assessment-related duties (Stiggins, 1992). Educational assessment is defined by practitioners as the process of acquiring information regarding a student's learning and includes a variety of forms, procedures, and approaches. Nicol argues that “assessment is said to drive student learning:

it can provide the motivation for learning (e.g., through the awarding of marks and grades), but it also enables learning to take place through the provision of feedback." (Nicol, 2008). Sulaiman et al. stated in their study of teachers' perceptions of evaluation and alternate assessment in the classroom. "to assess students' knowledge and skills, teachers need to implement several assessment instruments such as writing test, project, assignment, simulation, portfolio, journal, exhibition, observation, interview, oral exam, and peers evaluation."(Sulaiman et al. 2019).

On the other side, Mellar et al. found that teachers' attitudes were equivalent across all contexts, and that variances were attributable to unwillingness to deviate from an established, secure, and large-scale evaluation system. This was collected through an investigative research at two universities, one in Turkey and one in Bulgaria, from three sets of participants (administrators, teachers, and students) to uncover similar perspectives and discrepancies between conventional and online contexts (Mellar et al. 2018). Teachers' duties in virtual education settings, according to Alvarez et al. expand to encompass planning and design roles, social roles, and instructional roles, all of which overlap. Furthermore, each of these tasks has its own set of essential abilities, which may explain why, according to qualitative data, instructors felt their workload significantly increased once instruction went online (Álvarez et al. 2009). For example, instructors "have had to take on a technical support specialist's role, teaching students, among other things, how to download, upload, and share their work" (Al-Samiri, 2021). Nevertheless, they were particularly concerned with maintaining academic integrity in the face of internet dishonesty. This is due to one of the primary disadvantages of online assessment: the teacher has no means of knowing who is taking the exam. (Olt, 2002), affection of the evaluation overall validity and meaning could be attributed by anything that could disturb the achieved score, such as cheating. Reedy et al. discovered in a hisstudy that staff believed online cheating was simpler for scholars and were worried about that (Reedy et al. 2021).

Students' satisfaction

According to McMillan, the use of online assessment has no detrimental impact on learner success, and the advantages of online assessment are suitable and familiar by students(Spivey and McMillan, 2014). Furthermore, Wang suggested that the online assessment system might minimize the workload on instructors while improving educational efficiency (Wang, 2016). In addition, compared to traditional paper tests, several studies have found that online assessment exams provide instant feedback to students and aid in learning (Crews and Curtis, 2011, Eljinini et al. 2012, Marriott, 2009, Osuji, 2012). Conversely, students were unsatisfied with their inability to explain their responses and answers due to stringent computer technology settings, which increased their tension and uncertainty throughout the exam, according to a Betlej research (Betlej, 2013). In addition, the results of Gewertz's study revealed that students' preparation for the sort of online assessment they must complete, as well as the consistency of the exam, has an impact on their academic outcomes (Gewertz, 2013).

Students at PSUT are receptive to and tolerant of online assessment, according to the findings of these researches, and they also affirmed that they prefer online assessment. In addition, the findings corroborate earlier studies (Crews and Curtis, 2011, Eljinini et al. 2012, Marriott, 2009, Osuji, 2012) that found that opposed to traditional paper tests, students prefer online assessment since it gives faster feedback and helps them enhance their learning and understanding of curricular information. However, some students' replies in several studies revealed unfavorable views against the deployment of an online assessment, as they felt that online assessments would degrade their academic outcomes and force them to rely on multiple-choice questions. Furthermore, the findings of these research revealed that students' fear of being disconnected from the internet while taking online assessment examinations causes them a lot of worry (Betlej, 2013, Gewertz, 2013, Kim, 2020, Khan and Khan, 2019).

The diverse programs and applications used in online teaching and assessment

The program used in on line teaching and on line assessment Colleges and universities have used different innovative techniques, including leveraging software/apps such as Zoom, Google Classroom, and Microsoft Teams to take online classes. For the delivery of diverse courses, Chinese institutions established a digital instructional platform with cutting-edge digital technologies (Huang et al. 2020, Wu, 2020). Despite its status as a dependent delivery method, the model encompassed remote teaching and learning for all students, both international and global. The epidemic has prompted a movement away from traditional classroom teaching toward fully online degrees. In China the huge acceptance of Massive Online Learning Courses (MOOCs) caused by governmental order to close the campuses. Live-streaming applications and synchronized videoconferencing systems like Zoom, Skype, and Google Hangouts make MOOCs easier and more feasible (Wu, 2020, Fabienne, 2020). A nationwide site called the "National Cloud-Platform for Educational Resources and Public Service" was also developed to provide uniform educational services (O'Hagan, 2020). The majority of students in Hong Kong and other Chinese territories have started adopting interactive applications in their residence learning (Tam and El-Azar).

Numerous schools, colleges, and businesses in India have chosen e-learning and smart working as alternatives to traditional education at different levels. As a result, the

Indian government's digital vision is emerging as a critical instrument for resolving the COVID-19 dilemma. Because technology-based education is completely obvious (Jena, 2020). To meet this problem, the Indian government, as well as commercial businesses and state governments, took many efforts. The Ministry of Human Resource Development (MHRD) developed several arrangements, such as educational channels and internet portals that were broadcast directly to radios and home televisions. Students used common social media platforms such as Zoom, WhatsApp, Google Meet, Youtube Live, Telegram, and others to continue online learning throughout the lockdown. MHRD (e-Broucher-https://mhrd.gov.in/ict-initiatives), a CT initiative, is a revolutionary platform that brings together all online education's digital materials (Jena, 2020).

Prior to the COVID-19 epidemic, some colleges used multimedia platforms to alleviate the problem staff lacks (Cruickshank, 2020). During the epidemic, switching to virtual classrooms was critical, but the transition required unique learning activities and careful consideration of how to conduct evaluations. Faculty members at Johns Hopkins University (JHU) might utilize Zoom and Panopto, two web-based video-conferencing systems, to communicate and give lectures to students . Ministry of Education (MoE) in Saudi Arabia has closed schools, colleges and universities, and transmit traditional learning into courses online as Al-Samiri (Al-Samiri, 2021) clarifies: “In a brief timeframe, the whole country started the transition to remote learning environments, either it was televised on select channels or communicated through various online platforms: Telegram, Zoom, Teams, WebEx, and Blackboard”.

Learning at King Abdulaziz University (KAU) in Jeddah was shifted from traditional classrooms to Blackboard®, an online Learning Management System (LMS) with both synchronous and asynchronous components (Meccawy et al. 2021). For several years prior to the pandemic, some faculties used the university's LMS, Blackboard ®, for paid or executive online courses with external or distance learning students, so faculty and staff were aware of it and may have used it, but the same experience or level of knowledge of it and its features were not handled by everyone. “This software was not used extensively and served a supplementary role prior to the pandemic and its e-learning users are still discovering its features” (Al-Samiri, 2021). Also, in the College of Medicine at Qassim University, they conducted educational sessions and formative assessment through official online platforms, mainly through the Blackboard learning management system (LMS) version 9.1 (Blackboard, Washington, DC) (Elzainy et al. 2020).

What is next to COVID?

For several years, e-learning was adapted partly by several educational facilities to improve teaching, learning, and assessment process. When the pandemic of COVID-19 started, it forced all educational institutes to close to reduce the chances of spreading the disease. All educational institutes transformed to complete online learning and assessment in order to help students not to lose their time and progress. After these huge steps towards the using of e-learning, further studies and researches need to be conduct to detect the advantages and disadvantages of the experience to improve the quality and quantity of e-learning and e-assessment.

CONCLUSION

The COVID-19 pandemic had impact on people’s habits, politic, socioeconomic, and education. For education, it is forcibly transmitted from face-to-face or online manner with the aid of technology. Although, e-learning and e-assessment have been utilized globally, they still need more evaluation for their advantages and disadvantages and improving quality and quantity.

Practice points :

Policy and procedure that enables the faculty to plan, implement and evaluate and accredit program that adopt online and blinded teaching, learning and assessment.
Faculty enhancement regarding best practice of online and blinded teaching, learning and assessment.
Involving student in planning, implementation and evaluation of online and blinded teaching, learning and assessment, Using program with limited internet use to help both students and faculty live remote areas.
Using interactive methods in online and blinded teaching, learning and assessment.

CONFLICT OF INTEREST

The author has no conflict of interest in this work.

ACKNOWLEDGEMENT

The author would like to thanks Umm Al-Qura University for the support in conducting researches.

AUTHOR CONTRIBUTIONS

KJSB prepared the concept, collected the literature write and approved the final version of the manuscript and also wrote the manuscript.

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