TRAINING AND ADAPTIVE PERFORMANCE OF HEALTHCARE PROFESSIONALS IN THE ERA OF DIGITIZATION IN PAKISTAN

Munaza Bibi, Bahria University, Pakistan. Email: munaza.12star@yahoo.com

Abstract. *Currently, digitization in the healthcare segment starts to go head. The healthcare sector tries hard towards*

gaining excellence in the robust competitive environment of business on the way to the adoption of the latest technology. The current paper has described the importance of training in enhancing the adaptive performance of healthcare professionals in the era of digitization in Pakistan. The concept of adaptive performance has gained more importance now a day due to technological innovations in the field of healthcare. However, a collective refrain of adaptive performance is flexible as well as responsive behavior at the workplace that is desirable to adapt in the direction of the changes. The provision of training has now become an imperative practice to augment and prepare human resources to adapt the changes related to the latest technology in the healthcare setup such as digitized tools to administer drugs, interventions, machines, procedures, and software to manage the patient data efficaciously. Thus, the main element that affects the adaptive performance of healthcare professionals in organizations is training among other HR practices. Therefore, this study proposes that the healthcare sector needs to offer an up to date training programs to inculcate its employees the essential skills and knowledge to adapt the technological changes. As a developing country, it is important to train our professionals to manage and familiarize themselves with the anticipated technological changes to make a digitized healthcare system in Pakistan a reality.

Introduction

As the digitization has deep-rooted its veins in the developed countries (Petersen, 2019). Likewise, developing countries are also following the steps to make their day to day dealings digitized. Presently, on the way to the adoption of the latest technology like other organizations, the healthcare segment tries hard towards gaining excellence in adapting the latest innovations to deliver quality services to customers to survive in a robust competitive environment.

Also, in the boom of technological upheavals, all developing countries especially Pakistan has recently engaged to make their country digitized. Besides, like other sectors, the healthcare sector is also undergoing these changes in Pakistan; like most other facets of our lives are becoming digitized, there is no qualm that the future of healthcare will be digital (Munir, 2018). So, in this environment, the thirst to advance the position gives rise to dynamic changes in the workplace in which the performance of employees is a major concern area. Congruently, the performance of a human resource becomes a decisive area for the organization, particularly during the technological arena (Abdullah et al., 2014). For the accomplishment of the above-mentioned task, service organizations need to prepare their human resource to effectually adapt to the changes happening on the technological side. Thus, the concept of adaptive performance has gained more importance than before among other dimensions of employee performance because the healthcare segment is confronting with plentiful changes in terms of new digitize tools to administer drugs, monitoring and recording of patient data electronically by using software (Ventola, 2014) that will hold in the workplace. Likewise, Bhavnani, Narula, & Sengupta (2016) asserted that in healthcare system technological progressions such as iECG, handheld devices for ultrasound, as well as lab-on-a-chip technologies can eventually fallouts in improvising the quality of care delivery to the patient along with the reduction in healthcare cost as well. Moreover, concerning these transformations in the health care sector, medical professionals need to keep up their performance at the highest level to continually adapt to the quite challenging environment as their presentation is linked to the health of a patient. For case, Ansari (2018) explicated that the technological advancements in Pakistan give every person the hope that in case of a medical emergency there is the availability of a medical professional to handle the situation by using the latest technology accessible to them to give the support to patients they require at the right time and place.

According to Institute of Medicine (2002), in the hospitals, technology development is one of the substantial elements happening nowadays due to continuous advancement in diagnosing the diseases, treatment, and administration of medicines to treat the acute and chronic illness the patients have; as the use of technology cannot only support patients yet also support the medical professionals to make decisions in critical health situations. From this time, it is imperious for an employee to adapt the variations well to survive in the competitive environment (Baard, Rench, & Kozlowski, 2014; Qureshi, Najam, Khan, Nawaz, & Shah, 2014). Therefore, due to these alterations, the demand for adaptive performance by workers has amplified radically as per current workplace is also transformed from the traditional aspect to the modern one i.e., digitization (Hair, Wolfinbarger, Money, Samouel, & Page, 2015;

Vuori, Helander, & Okkonen, 2018). Due to digitization in the healthcare segment, the adaptive performance of employees has now emerged as a substantial aspect (Sutherland & Heuvel, 2006)among others to attain the competitiveness of an organization.

Also, this scenario of changing technologies demanding personnel to acquire novel behaviors, new skills to deliver as well as perform their works well in difficult situations. Correspondingly, Tabiu, Pangil, & Othman (2018) discussed in their study that training is an important HR practice that enhances the skills and knowledge of personnel which in turn improves the adaptive performance of human resources. On the other side, Abdullah et al. (2014) explicated that the most important challenge healthcare employees in Pakistan are facing is the lack of training to deal with the changes efficaciously. Therefore, the technological change can only become effective when the health professionals are capable to deal with the high-tech up-gradations. Similarly, Ittefaq & Iqbal (2018) expressed the same view that healthcare professionals become capable to embrace the digital changes aptly by taking the training; as a result of these initiatives the dream of digitized health care services in Pakistan becomes a reality. Moreover, Hoodbhoy, Hasan, & Siddiqui (2019) stated that lack of training is one of the main hurdles identified by medical professionals related to digitization in Pakistan. As a result, keeping the aforementioned arguments investigators need to focus on highlighting the importance of training in stimulating the adaptive performance of professionals working in healthcare setup in Pakistan. Nevertheless, limited study exists specifying the importance of training in the health-related digitization and its role in improving the adaptive performance of health care employees in Pakistan. For that reason, the present study is circumscribed to have more comprehensive consideration by an emphasis on the significance of training for enhancing the adaptive performance of healthcare professionals in the era of digitization.

Methodology Related to Review of Literature

A review of the literature in the present study was conducted to deliberate the importance of training, and how training affects the adaptive performance of healthcare professionals. For the attainment of this task, secondary sources of data were retrieved including Google Scholar, Science Direct and Taylor, and Francis and other well-reputed journals for the collection of articles related to the current study. Also, searching for relevant data was done by employing keywords like training, adaptive performance, and digitization in the health care sector. In the meantime, a wide-ranging body of literature is accessible; it is not possible to take in each article that is published. Thus, to present a

comprehensive review, the relevant material was selected based on content eminence and significance to the existing study, while due attention is assumed to embrace argument grounded on the recent publications.

Review of Literature

Digitization in the healthcare sector

The term digitization is a process an organization adopts to take analog information into zeroes via encoding; so that processers can accumulate, process, as well as transmit information (Bloomberg, 2018), for instance, digitization in organizations has been converting handwritten text hooked on digital form. Similarly, digitization has started to infiltrate the health care structures whereas the emerging health technologies have changed unceasingly the diagnostic procedures, preventive measures, treatment along with rehabilitation possibilities (Safi, Thiessen, & Schmailzl, 2018), as a result, health organizations have too changed into multifaceted entities through altering responsibilities meant for patients, health experts, payers as well as regulators. Accordingly, the digital transformation in health services is perceived as an influential process to make a considerable influence on health care system (Anastasy et al., 2019) and it is anticipated to have an additional effect on health care arena in the future like eHealth, telemedicine, mHealth, imaging, telecare, artificial intelligence, management of health records electronically, etc. Accordingly, Hoodbhoy et al. (2019) make clear that the use of emerging technologies like artificial intelligence can help in decreasing health disproportion through recognition and diagnosis of disease at early stages along with refining the current healthcare services quality. Therefore, in the service sector especially the healthcare segment is experiencing abundant transformations due to drastic technological developments in the area of anesthetics, antibiotics, magnetic resonance imaging, and radiotherapy via using artificial intelligence, robotics, wearable tech, genomics and use of 5G (Marr, 2019).

Like other sectors, artificial intelligence is also commencement to be applied to the healthcare sector (Rysavy, 2013). In the healthcare area, artificial intelligence (AI) and interrelated technologies are going to make a drastic transformation by offering new and better methods to detect disease along with diagnosing the acute and chronic conditions through developing treatment plans as well as monitoring of epidemics & endemics conditions, medical research whereas making the performance of clinical trials efficiency better, and also help to make clinical &administrative operations more effective to handle the augmented burdens on the healthcare system (Davenport & Kalakota, 2019) due to increase in population. Similarly, artificial intelligence can be applied in the emergency department for predictive modeling,

monitoring of patients, and operations (Baig & Sheikh, 2019). Without a doubt, it seems gradually clearer that the presence of artificial intelligence systems will not substitute the way healthcare professionals work; nonetheless, it will amplify their efforts to deliver quality care aimed at patients. Equally, digitization is a new way ahead in all sectors of Pakistan including the healthcare segment. As Mumtaz (2019) explicated that the healthcare arrangement of Pakistan can be refurbished by employing a digital upheaval moving from traditional (paperwork) to modern approaches such as database storage, use of applications to track patients, to transport medicines toward patients along with applications of research work, modern diagnostic and intervention machines laterally with plentiful software applications to integrate the healthcare systems.

Consistently, the main issue the developing countries undergo is a prevalence of diseases along with the absence of trained healthcare professionals and infrastructure to adapt the technology for effective delivery of services (Guo & Li, 2018; Panch, Szolovits, & Atun, 2018). As Hoodbhoy et al. (2019) also point out numerous challenges that are faced by organizations including healthcare professionals training, availability of education and infrastructure to adopt the emerging technologies to make professionals equipped with sets of digital skills in health care setup to adjust with the changes through performing at the highest level. Besides, in developing countries, the medical field is perhaps partaking benefits from evolving technologies by the provision of training (Guo & Li, 2018). Correspondingly, Shahzad (2018) argued that in the coming years Pakistan will perhaps become a country of having a digitized system together with having a skilled human resource just because of timely availability of training session that can eventually help the professionals to demonstrate a high level of performance together with the development of infrastructure to adopt technologies like artificial intelligence.

According to Bandi, Angadi, and Shivarama (2015) digitization is not an easy task for organizations as it requires four M's i.e., money, machines (storage devices, systems, and software), manpower (must be trained & skilled) and materials to fully implement this process. Also, there will continuously be a human component present in the field of medicine whereas over time the healthcare professionals who perhaps will mislay their occupations might be those who reject or not adopt the changes to perform effectually (Ghashghaeizadeh, Hoseinpour, & Jameie, 2018; Murali & Sivakumaran, 2018; Rigby, 2019). The next section discusses the adaptive performance and

training along with describing the importance of training in affecting the adaptive performance amongst professionals working in hospitals.

Adaptive performance

When viewing the performance of an individual, numerous dimensions that plentiful authors have identified like adaptive performance (Pulakos et al., 2002), task performance and contextual performance (Sonnentag, Volmer, & Spychala, 2008). Accordingly, Pulakos, Arad, Donovan, & Plamondon (2000), argued that the concept of adaptability is not a new one, yet from time to time the increasing pace of transformations has made researchers along with industry & service practitioners to deeply comprehend the phenomena by adopting strategies to augment the adaptive behavior among employee in the work environment. Similarly, Charbonnier-Voirin & Roussel (2012) provided a characterization of adaptive performance as a substantial capability present in the overall performance of a worker to modify their behavior to become potential personnel who is capable to meet the requirements of a novel situation. Likewise, the concept of adaptive performance is pertinent to all organizations that are having a complex and volatile working condition as in the case of healthcare organizations. Consequently, the health care organizations are usually more prone to face challenges linked to adapting the software, tools, drugs, machines, procedures, working environment and technological up-gradation on one side while for healthcare professionals to learn and maintain the performance is another challenge on the other side (Lewis, 1998; Ten Cate, Snell, & Carraccio, 2010). Then the medical professionals demonstrating poor performance can partake serious outcomes for patients as well as for organization in general, performance needs to improvise adequately to deal with the changes (Naami, Behzadi, Parisa, & Charkhabi, 2014), as it cost serious consequences for healthcare professionals, organization and patients.

When assessing the definitions related to adaptive performance in the current literature some investigators like Hesketh and Neal (1999) viewed it as an ability of an individual to adapt the techniques to handle the uncertain situation happening in the dynamic setup at work. On the other side, Johnson (2001) seeing adaptive performance as a person's capacity in place of adapting towards continually changing work situations by modifying behavior conferring to the rations of new environments and technology. Equally, Griffin et al. (2007) contended that to succeed in changes can contingent upon employee willingness to adapt, respond & support the changes by adopting strategies like enhancement of skills, knowledge, and education in the work environment. Accordingly, Charbonnier-Voirin and Roussel (2012) have asserted that a person needs the capability and readiness to involve themselves

in learning new skills and knowledge in an effectual way to pact with the transformation in the era of digitization especially when organizations are facing continuous technological revolution and the development of several professions. For example, in the healthcare sector, the capacity of professionals such as doctors, physicians, nurses, and allied health-supporting staff to adapt the changes towards performing a designated job by accepting, coping & adopting a new technique for administration of medication, diagnostics interventions and procedures. Then, adaptive performance is an essential element of employee performance in reply to changes occurs due to new technology introduction as well as redesigning of job policy that requires from individual to acquire and improve their competencies to meet the necessity of shifting in the working milieu. Moreover, Marques-Quinteiro et al. (2018) regarded adaptive performance as a behavioral response assortment in which people engross when getting ahead or undergoing uncertainty and variations in the environment. Correspondingly, adaptive performance is defined by Park & Park (2019) as bendable behaviors at work that help personnel to adapt the alteration effectively through representing distinction in solving a problem, controlling the stress and crisis by learning continuously.

According to Bell & Kozlowski (2008), an employee can face pressures and changes from both sides i.e., internal as well as external (Chan, 2000) whereas the external factors that instigate from many sides comprising of economic & political uncertainty, shifts in social, organizational structures as well as culture variations due to globalization and technological advancements (Burke, Stagl, Salas, Pierce, & Kendall, 2006; Hutton et al., 2017; Shoss, Witt, & Vera, 2011; Stokes, Schneider, & Lyons, 2010). Particularly from the viewpoint of technological advancements when the world is transforming from the traditional way of doing things into a modern digital-based way of doing things at the workplace then the adaptive performance has gained special attention. Moreover, from the organization as well as the social systems viewpoint, being skilled to perform adaptively is a mandatory element for sustainability (Marques-Quinteiro, Vargas, Eifler, & Curral, 2018). At the same time, the term adaptation in the twenty-first century is considered an important aspect for professionals who work under uncertain conditions along with rapidly changing circumstances within and outside the organization (Jundt, Shoss, & Huang, 2015; Pulakos et al., 2002). Consistently, McGregor & Doshi (2017) elucidated parallel views concerning the adaptive performance they argue that it is important for professionals to produce value for an organization in a situation of swift technological advancements, volatility, and ambiguity. Similarly, investigators like Ramzan et al. (2016) shared the equivalent interpretations regarding the adaptive performance that a person must take

quick and suitable decisions to accomplish the goals with the capability to persuade coworkers to adapt to the continuous changes happening due to technological revolution. Indeed, the employee performance constructs since the 1990s has been extended to contain behaviors that align with adapting the changes in the organization. For instance, the most important aspect of employee performance i.e., adaptive performance has now become a crucial factor for today's organization to attain a competitive advantage among other organizations (Pulakos, Dorsey, & White, 2006; Reeves & Deimler, 2011).

In contrast to this, as the world is undergoing continuous flux, then the organizations together with behaviors of employees at work can be no longer categorized as unchanging and anticipated (Heuvel, Demerouti, Bakker, & Schaufeli, 2013; Sony & Mekoth, 2016), as human resources need to upgrade their skills and knowledge continue to deal with forthcoming ventures by performing effectually. Henceforth, employees are often facing conditions categorized through uniqueness, unpredictability, changeability, and complications in the work area particularly the healthcare setup (Thimbleby, 2013). Thus, adaptive performance has gained more importance among researchers in the current literature. This unpredictability in the environment is present due to drastic technological developments in the service sector in the area of anesthetics, patients dealings, software, antibiotics, magnetic resonance imaging and radiotherapy via using artificial intelligence, robotics, wearable tech, genomics and use of 5G (Marr, 2019). In the current study, our main focus is on the adaptive performance of an individual because today's organizations are facing numerous changes at the technological level, particularly in Pakistan especially in healthcare setup.

So, the service-related professions need workers to acquire the skills, knowledge & eagerness to adapt the shifting as well as changes by learning new ways to handle the rapid changes in a creative and efficient means (Ramzan, Danish, & Ali, 2016). As a result, human resources performance plays an important part to deal with the technological revolutions in healthcare setup (Thimbleby, 2013); whereas training helps the professionals to deal with these drastic changes. Besides, Ilgen & Pulakos (1999) explained that in the context of workplace plentiful features confronted by the human resources like vagueness and turbulence, which be necessary to assess the appropriateness of accustomed measures related to the performance of an employee, that solely center on the completion of designated responsibilities or tasks enumerated in job descriptions (JD). Notably, there is a need to redefine the behaviors as per the changes happening in the organization to attain the established purposes (Baard et al., 2014; Griffin, Neal, & Parker, 2007). In place of this argument, adaptive performance has now emerged as an important dimension of employee performance in an era of digitization. Therefore, under this canopy,

adaptive performance can be delineated as the ability of professionals to deal with physical strain by adapting the approaches to handle uncertain situations.

Significance of Training in the improvement of Adaptive Performance

Technological development is a vital way onward in the twenty-first century as the proliferation of digital technology developments makes picking the right technique for digitizing the organizational resources while it is primarily important to assess and develop an approach to fully conquer as well as gaining the benefits of going forward with digitization (Devi & Murthy, 2005). According to Blume, Ford, Baldwin, & Huang (2010), training is a crucial aspect of HR practices to improvise the knowledge and skills needed in diverse settings among people having different capabilities and it needs to be preserved over time. So, training is a way of doing planned actions by an organization towards enabling a member to learn the job-related proficiencies which eventually result in increasing the skills, behaviors, and knowledge in realizing job performance effectually (Noe, Hollenbeck, Gerhart, & Wright, 2010; Sraku-Lartey, Acquah, Samar, & Djagbletey, 2017). Likewise, similar views elucidated by Karatepe, Yavas, & Babakus (2007) that the availability of training to workforces in the organization is an essential aspect because, in the end, it decides the failure or success of every industry. On the opposing side, when the person is not having requisite skills and knowledge to adapt the variations in uncertain circumstances then organizations need to offer training as it is the main aspect of HR practices that can enable and support to acquire the skills to demonstrate the adaptive performance (Han & Williams, 2008). Compatibly, Chen, Thomas, & Wallace (2005) beheld that programs offered for training by an organization help in developing skills and information in adapting the new technological developments that enable adaptive performance directly. For case in point, Şahin & Gürbüz (2014) claimed that some situations required adjustments for which an employee prepare themselves by adopting numerous strategies in which training is a critical factor as they can perform well at the current task and prepare themselves for the future adaptations as well.

Besides, for stimulating the highest level of adaptive performance organizations need to provide training together with familiarizing the workforces with the concept of adaptation in an ambiguous setting to signify the demonstration of adaptive behaviors by professionals (Naami et al., 2014). At precision, according to McGregor & Doshi (2017), training would lead to having a good adaptive performance at each level in the organization to come up with novel ideas to aid a coworker to unravel unanticipated issues and

situations. Thus, training is the main strategy a health care organization needs to adopt to boost a person's capacity intended to adapt to technological changes. Consistently, two leading perspectives were expounded by Chan (2000) regarding the adaptation of behavior to perform is comprised of prior differences at an individual level i.e., the selection perspective whereas an emphasis on building the capacity along with the acquisition of skills is delineated as the training perspective. Henceforth, Nasurdin, Ahmad, & Tan (2015) shared the parallel sights that provision of training to employees in the organization is well-thought-out to be the most prevalent practice to manage HR that upsurges skills as well as experiences to engross in constructive behaviors.

As Rhodes, Short, & Shaben (2017) viewed that to adapt the changes, health care professionals perhaps must receive training as soon as new technologies are introduced into the healthcare settings that improve learning as well as the behavioral change in a meaningful way by using different techniques such as one-to-one instruction, traditional classroom-based instruction, and electronic learning tools. Additionally, Writer (2017) avowed that to embrace technological changes proper training is an essential area for workers to abundantly comprehend how to use the technology on one side, while without training they are unable to use the technology and it may also slow down the provision of quality healthcare processes to patients. Furthermore, Khalid & Abbasi (2018) have specified that in the healthcare sector the delivery of quality care to patients depends on the team of trained professionals comprising doctors, nurses, paramedics, pharmacists, personnel working at the laboratory, administrative personnel, government agencies, and policymakers play an imperative part in providing the services. In the same vein, Anwar, Kumar, and Sulaiman (2013) said that trained health professionals are preconditions intended for creating a successful health system to deal with healthcare new technologies. In contrast, untrained staff can create a detrimental effect on service delivery. Yet the main challenge a healthcare professional is confronted with is the lack of training and systematic prioritization of infrastructure to be digitized. Correspondingly, Khurshid (2010) has unveiled that one of the main challenges healthcare professionals face is the lack of training related to information technology. For that reason, healthcare organizations in Pakistan are mandated towards providing training to health professionals to handle the continually changing technology. Similarly, Allen (2011) has explicated similar observations that as technology endures to transform the methods by which services are provided, thus healthcare professionals are at the vanguard of adopting and applying new technologies by demonstrating adapting behavior at the workplace while it is

possible only by providing training to adapt the changes on the way to warrant that attention on patient care is not ever mislaid.

Consistently, in Pakistan, the government needs to realize and plan carefully regarding the investment in healthcare technology, while also focusing on the training of healthcare professionals because it is linked to the patients and organization wellbeing as investigators like Qureshi et al. (2014) explained that transformation of current paper-centered healthcare system into the technology-based system is not possible without the provision of basic knowledge as well as training related to information technology to healthcare professionals in Pakistan. In addition, digitization entails valor as per the advancement comes from cultivating and adapting present products towards meeting the needs of customers well. Besides, training must be available, to the professionals working in hospitals who have the greatest necessity for such exercise to successfully adopt the technology to meet the demands of patients and organizations as well. So, the government needs to make a policy that must be implemented at the federal as well as national level to make the healthcare system fully digitized that will not only ease the healthcare providers, also the patient and their families. Base on review, healthcare organizations need to adopt the different strategies to train their professionals as per Rhodes et al. (2017) expounded that one-to-one instruction, traditional classroom-based instruction, and electronic learning tools.

Conclusion

Over the past decades' healthcare systems have undergone rigorous changes, improvements, expansions, and progress from the traditional to modern approaches globally. Likewise, Pakistan is also facing the same changes in the healthcare organization (Qureshi et al., 2014). Therefore, in the situation of continuous technological changes, the fundamental aspect is the adaptive performance of medical professionals in healthcare organizations. However, a collective refrain of adaptive performance is flexible as well as responsive behavior at work desirable to adapt to the changes. Thus, the main element that affects the adaptive performance in organizations is training based on the extant literature. In a nutshell, a health care organization must implement the training program because it is helpful to augment and prepare their human resource to adapt the changes effectually related to the technological aspect to handle the machines, tools as well as software related to the patient data, medication as well as intervention procedures. Keeping in view the changing scenario in the healthcare sector, management of public and private hospitals needs to offer training sessions to healthcare professionals to learn the new skills and knowledge that help them to deal with emerging technology like

artificial intelligence. So, when the training of the healthcare users (like students, doctors, nurses, paramedical staff, and allied healthcare professionals) related to information technologies increases, then the prospect of successful execution of technology-based health procedures also intensifies. Subsequently, it is important for professionals working in health setups to be aware of the application related to digital aspects in hospitals proactively. Besides, it is possible only when an organization offers timely and appropriate training to professionals regarding the usage of tools, software, and devices that would be used to cater to the patients (Qureshi et al., 2014). Therefore, adaptive performance is an important aspect for healthcare professionals now a day than beforehand whereas training is a crucial factor in stimulating and motivating human resources to show a higher level of adaptive performance to make Pakistan a hub of digitization.

References

Abdullah, M. A., Mukhtar, F., Wazir, S., Gilani, I., Gorar, Z., & Shaikh, B. T. (2014). The Health Workforce Crisis in Pakistan: A Critical Review and the Way Forward. *World Health & Population, 15*(3), 4-12.

Allen, A. (2011). Technology meets challenges, but training ensures success. *Nursing Management (Springhouse), 42*(12), 35-36.

Anastasy, C., Barros, P. P., Barry, M., Bourek, A., Brouwer, W., Maeseneer, J. D., . . . Wild, C. (2019). *Assessing The Impact Of Digital Transformation Of Health Services*: Luxembourg: European Union.

Ansari, E. (2018, October 27). As technology advances, so does healthcare in Pakistan - convenient and free, all in the palm of your hand. *Express Tribune*.

Anwar, F., Kumar, R., & Sulaiman, S. (2013). Health informatics in Pakistan: Current scenario in capacity development for health professionals. *The Health, 4*(4), 62-65.

Baard, S. K., Rench, T. A., & Kozlowski, S. W. (2014). Performance adaptation: A theoretical integration and review. *Journal of Management, 40*(1), 48-99.

Baig, M., & Sheikh, S. (2019). The impact of artificial intelligence in emergency medicine. *South Asian Journal of Emergency Medicine, 2*(2), 6-7.

Bandi, S., Angadi, M., & Shivarama, J. (2015). *Best Practices in Digitisation: Planning and Workflow Processes*. Emerging technologies & future of Libraries: Issues & Challenges. Retrieved from http://eprints.rclis.org/24577/1/Digitization%20ETFL-2015. pdf

Bell, B. S., & Kozlowski, S. W. J. (2008). Active learning: Effects of core training design elements on self-regulatory processes, learning, and adaptability. *Journal of Applied Psychology, 93*, 296-316.

Bhavnani, S. P., Narula, J., & Sengupta, P. P. (2016). Mobile technology and the digitization of healthcare. *European Heart Journal, 37*(18), 1428-1438.

Bloomberg, J. (2018, Apr 29). Digitization, Digitalization, And Digital Transformation: Confuse Them At Your Peril. *Forbes*.

Blume, B. D., Ford, J. K., Baldwin, T. T., & Huang, J. L. (2010). Transfer of training: A meta-analytic review *Journal of Management, 36*, 1065- 1105.

Burke, C. S., Stagl, K. C., Salas, E., Pierce, L., & Kendall, D. (2006). Understanding team adaptation: A conceptual analysis and model. *Journal of Applied Psychology, 91*(6), 1189-1207.

Chan, D. (2000). Understanding adaptation to changes in the work environment: Integrating individual differences and learning perspectives. *Research in Personnel and Human Resources Management, 18*, 1-42.

Charbonnier-Voirin, A., & Roussel, P. (2012). Adaptive Performance: A New Scale to Measure Individual Performance in Organizations. *Canadian Journal of Administrative Sciences, 29*, 280-293.

Chen, G., Thomas, B., & Wallace, J. C. (2005). A multilevel examination of the relationships among training outcomes, mediating regulatory processes, and adaptive performance. *Journal of Applied Psychology, 90*(5), 827-841.

Davenport, T., & Kalakota, R. (2019). The potential for artificial intelligence in healthcare. *Future Healthcare Journal, 6*(2), 94-98.

Devi, S., & Murthy, T. (2005). The need for digitization. In C. R. Singh (Ed.), *Digital Information Resources & Networks on India: Essays in Honor of Professor Jagindar Singh Ramdev on his 75th Birthday.* New Delhi: UBS Publisher's Distributors Pvt.Ltd.

Ghashghaeizadeh, N., Hoseinpour, M., & Jameie, M. (2018). The prediction of nurse's adaptive performance based on psychological capital and spiritual intelligence (Case study: Shaidzadeh Hospital of Behbahan) *Iranian Journal of Nursing Research, 13*(5), 52-57.

Griffin, M. A., Neal, A., & Parker, S. K. (2007). A new model of work role performance: Positive behavior in uncertain and interdependent contexts. *Academy of Management Journal, 50*(2), 327-347.

Guo, J., & Li, B. (2018). The Application of Medical Artificial Intelligence Technology in Rural Areas of Developing Countries. *Health Equity, 2*(1), 174-181.

Hair Jr, J. F., Wolfinbarger, M., Money, A. H., Samouel, P., & Page, M. J. (2015). *Essentials of Business Research Methods*: Routledge.

Han, T. Y., & Williams, K. J. (2008). A multilevel investigation of adaptive performance individual-and team-level relationships. *Group & Organization Management, 33*(6), 657-684.

Hesketh, B., & Neal, A. (1999). *Technology and Performance. In D.R. Ilgen & D.P. Pulakos (Ed.), The Changing Nature of Performance: Implications for Staffing, Motivation, and Development*. San Francisco: Jossey-Bass.

Heuvel, M., Van den, Demerouti, E., Bakker, A. B., & Schaufeli, W. B. (2013). Adapting to change: The value of change information and meaning-making. *Journal of Vocational Behavior, 83*(1), 11-21.

Hoodbhoy, Z., Hasan, B., & Siddiqui, K. (2019). Does artificial intelligence have any role in healthcare in low resource settings? *Journal of Medical Artificial Intelligence, 2*(13), 1-2.

Hutton, R., Ward, P., Wilson, K. M., Conway, G., Amey, D., Lamb, S., & Capewell, D. (2017). *Developing Adaptive Performance Skills for Agile C2.* Paper presented at the 22nd International Command and Control Research & Technology Symposium, Los Angeles, USA.

Ilgen, D. R., & Pulakos, E. D. (1999). *Employee Performance in Today's Organizations.* (D.R. Ilgen & D.P. Pulakos ed.). San Francisco: Jossey-Bass.

Institute of Medicine (US) Committee on Assuring the Health of the Public in the 21st Century. (2002). *The Future of the Public's Health in the 21st Century; The Health Care Delivery System*. Washington (DC): National Academies Press (US).

Ittefaq, M., & Iqbal, A. (2018). Digitization of the health sector in Pakistan: challenges and opportunities to online health communication: A case study of MARHAM social and mobile media. *Digital Health,* 2055207618789281-2055207618789281.

Johnson, J. W. (2001). The relative importance of the task and contextual performance dimensions to supervisor judgments of overall performance. *Journal of Applied Psychology, 86*(5), 984-996.

Jundt, D. K., Shoss, M. K., & Huang, J. L. (2015). Individual adaptive performance in organizations: A review. *Journal of Organizational Behavior, 36*, 53-71.

Karatepe, O. M., Yavas, U., & Babakus, E. (2007). The effects of customer orientation and job resources on frontline employees' job outcomes. *Services Marketing Quarterly, 29*(1), 61-79.

Khalid, F., & Abbasi, A. N. (2018). Challenges Faced by Pakistani Healthcare System: Clinician's Perspective. *Journal of the College of Physicians and Surgeons Pakistan, 28* (12), 899-901.

Khurshid, A. (2010). Health Care Management Training Needs in Pakistan. *Journal of Health Management, 12*(3), 211-229.

Lewis, M. (1998). Lifelong learning: Why professionals must have the desire for and the capacity to continue learning throughout life. *Health Information Management, 28*(2), 62-66.

Marques-Quinteiro, P., Vargas, R., Eifler, N., & Curral, L. (2018). Employee adaptive performance and job satisfaction during an organizational crisis: the role of self-leadership. *European Journal of Work and Organizational Psychology*, 1-16.

Marr, B. (2019, Nov 1). The 9 biggest technology trends that will transform medicine and healthcare in 2020. https://www.forbes.com/sites/bernardmarr/2019/11/01/the-9-biggest-technology-trends-that-will-transform-medicine-and-healthcare-in-2020/#430366bc72cd

McGregor, L., & Doshi, N. (2017, October 10). There are two types of performance—but most organizations only focus on one. *Harvard Business Review*. https://store.hbr.org/product/there-are-two-types-of-performance-but-most-organizations-only-focus-on-one/H03Y0Z

Mumtaz, D. N. (2019, August 10). Digital healthcare: A far cry. *Daily Times*.

Munir, S. (2018, May 7). Future of digital healthcare platforms in Pakistan. Techjuice. Retrieved from https://www.techjuice.pk/future-of-digital-healthcare-platforms-in-pakistan/

Murali, N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare: A review. *International Journal of Modern Computation, Information and Communication Technology, 1*(6), 103-110.

Naami, A., Behzadi, E., Parisa, H., & Charkhabi, M. (2014). A Study on the Personality Aspects of Adaptive Performance among Governmental Hospitals Nurses: A Conceptual Model. *Procedia - Social and Behavioral Sciences, 159*, 359-364.

Nasurdin, A. M., Ahmad, N. H., & Tan, C. L. (2015). Cultivating service-oriented citizenship behavior among hotel employees: The instrumental roles of training and compensation. *Service Business, 9*(2), 343-360.

Noe, R. A., Hollenbeck, J. R., Gerhart, B., & Wright, P. M. (2010). *Human Resource Management: Gaining a Competitive Advantage* (7 ed.). New York: McGraw-Hill/Irwin.

Panch, T., Szolovits, P., & Atun, R. (2018). Artificial intelligence, machine learning, and health systems. *Journal of Global Health, 8*(2), 1-8.

Park, S., & Park, S. (2019). Employee adaptive performance and its antecedents: Review and synthesis. *Human Resource Development Review*, *18*(3), 1-31.

Petersen, T. (2019). Digital Economy: How is digitalization changing global competitiveness and economic prosperity. https://ged-project.de/ blogpostsen/digital-economy-how-is-digitalization-changing-global-competitiveness-and-economic-prosperity.

Pulakos, E., Schmitt, N., Dorsey, D., Arad, S., Borman, W., & Hedge, J. (2002). Predicting Adaptive Performance: Further Tests of a Model of Adaptability. *Human Performance, 15*, 299-323.

Pulakos, E. D., Arad, S., Donovan, M. A., & Plamondon, K. E. (2000). Adaptability in the workplace: development of a taxonomy of adaptive performance. *Journal of Applied Psychology, 85*(4), 612-626.

Pulakos, E. D., Dorsey, D. W., & White, S. S. (2006). *Adaptability in the Workplace: Selecting an Adaptive Workforce.* (C. S. Burke, L. G. Pierce & E. Salas ed.). Oxford; UK: Elsevier Ltd.

Qureshi, Najam, Khan, M. Z., Nawaz, A., & Shah, B. (2014). Issues and Prospects of e-health in Pakistan. *Mediterranean Journal of Medical Sciences, 1*, 31-52.

Qureshi, Q. A., Shah, D. B., Nawaz, D. A., Khan, I., Waseem, M., & Muhammad, D. F. (2014). E-Health in Pakistan: Issues and prospects. *Journal of Biology, Agriculture and Healthcare, 4*(17), 106-115.

Reeves, M., & Deimler, M. (2011, July–August). Adaptability: The new competitive advantage. *Harvard Business Review*.

Rhodes, B., Short, A., & Shaben, T. (2017). *Effectiveness of Training Strategies That Support Informatics Competency Development in Healthcare Professionals*: Health Professionals' Education in the Age of Clinical Information Systems, Mobile Computing, and Social Networks.Elsevier Inc.

Rigby, M. J. (2019). Ethical Dimensions of Using Artificial Intelligence in Health Care. *AMA Journal of Ethics, 21*(2), 121-124.

Rysavy, M. (2013). Evidence-based medicine: a science of uncertainty and an art of probability. *Virtual Mentor, 15*(1), 4-8.

Safi, S., Thiessen, T., & Schmailzl, K. J. (2018). Acceptance and Resistance of New Digital Technologies in Medicine: Qualitative Study. *JMIR research protocols, 7*(12), e11072. doi:doi.org/10.2196/11072

Şahin, F., & Gürbüz, S. (2014). Cultural intelligence as a predictor of individuals' adaptive performance: A study in a multicultural environment. *International Area Studies Review, 17*(4), 394-413.

Shahzad, K. (2018, NOVEMBER 17). Boosting Pakistan with Artificial Intelligence. *Daily Times*.

Shoss, M. K., Witt, L. A., & Vera, D. (2011). When does adaptive performance lead to higher task performance? *Journal of Organizational Behavior, 33*(7), 910-924.

Sraku-Lartey, M., Acquah, S. B., Samar, S. B., & Djagbletey, G. D. (2017). Digitization of indigenous knowledge on forest foods and medicines. *International Federation of Library Associations and Institutions, 43*(2), 187-197.

Ramzan, S., Danish, R. Q., & Ali, H. (2016). Impact of Organizational Learning on Adaptive Performance: A Dimension-wise study on Chemical Industry of Pakistan *South Asian Journal of Banking and Social Sciences, 2*(01), 66-82.

Sonnentag, S., Volmer, J., & Spychala, A. (2008). *Job Performance: Micro Approaches* (Vol. 1). Los Angeles: SAGE.

Sony, M., & Mekoth, N. (2016). The relationship between emotional intelligence, frontline employee adaptability, job satisfaction, and job performance. *Journal of Retailing and Consumer Services, 30*, 20-32.

Stokes, C. K., Schneider, T. R., & Lyons, J. B. (2010). Adaptive performance: A criterion problem. *Team Performance Management, 16*((3/4)), 212-230.

Sutherland, J., & Heuvel, W.J. (2006). *Towards an Intelligent Hospital Environment: Adaptive Workflow in the OR of the Future.* Paper presented at the Proceedings of the 39th Hawaii International Conference on System Sciences Hawaii.

Tabiu, A., Pangil, F., & Othman, S. Z. (2018). Does Training, Job Autonomy, and Career Planning Predict Employees' Adaptive Performance? *Global Business Review, 21*(3), 1-12.

Ten Cate, T. J. O., Snell, L., & Carraccio, C. (2010). Medical competence: the interplay between individual ability and the health care environment. *Medical Teacher, 32*(8), 669-675.

Thimbleby, H. (2013). Technology and the future of healthcare. *Journal of Public Health Research, 2*(3), e28.

Ventola, C. L. (2014). Mobile devices and apps for health care professionals: uses and benefits. *P & T: A Peer-Reviewed Journal for Formulary Management, 39*(5), 356-364.

Vuori, V., Helander, N., & Okkonen, J. (2018). Digitalization in knowledge work: the dream of enhanced performance. *Cognition, Technology & Work*, 1-16.

Writer, S. (2017 18 May). Preparing Healthcare Workforce For Tech Advancements. *Bold Business*. Retrieved from https://www.boldbusiness. com/health/preparing-healthcare-workforce-technological-advancements/