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Role of information & communication technology (ICT) and e-governance in health sector of Pakistan: A case study of Peshawar

Izhar Ud Din¹, Ma Cai Xue¹*, Abdullah², Sajjad Ali², Tariq Shah³ and Aasir Ilyas²

Abstract: The purpose of this research is to investigate the role of information & communication technology (ICT) and e-governance in health sector of Pakistan, where these facilities are at initial stage of development. This study utilizes primary data collected from 170 patients in both public and private hospitals of district Peshawar Pakistan. This is an exploratory study and descriptive statistics are being used for the analysis of the data. The result of the study shows that the use of e-governance in health sector is at a rudimentary stage in the study area. Few people use ICT for medical purposes but the overall level is low. There is need of awareness. In addition, the facilitating conditions for the adoption of e-governance in health sector include infrastructure, electricity, proper user interface and data privacy & confidentiality. The government needs to initiate practical steps for the implementation of e-governance in health sector. This will improve the efficiency, transparency, and accountability of the system. Moreover, it will also speed up the service delivery system. The study is valuable as it explored the role of ICT and e-governance in health sector of Pakistan for the first time. Therefore, this study contributed to literature in a positive way.

Subjects: Politics & International Relations; Social Sciences; Development Studies

Keywords: e-governance; health sector; information & communication technology; Peshawar

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ABOUT THE AUTHOR

Izhar Ud Din is currently doing master degree in Public Administration at Huazhong Agricultural University Wuhan China on Chinese Government Scholarship. The purpose of this research is to explore the role of e-governance and ICT in health sector of Pakistan. E-governance can be defined as an interaction between people and government through the use of technology. He has been actively involved with international student office (ISO) of the university helping and guiding students. His research interest includes e-governance, E-health, public management and public administration. He also planned to conduct future studies in the area of e-governance. Moreover, he has diverse work experience in the field of teaching and administration.

PUBLIC INTEREST STATEMENT

According to the estimates of World Bank, the per capita spending of Pakistan on health is US$37 which is lower than the prescribed level of US$44 by World Health Organization. E-governance can be defined as an interaction between people and government through the use of technology. The role of e-governance in health sector of Pakistan is explored. It is expected that it will leads to efficiency, transparency and accountability. Moreover, it will speed up the delivery system. This study also examined the facilitating conditions which are required for the adoption of e-governance in health sector such as infrastructure, proper user interface and data privacy & confidentiality. In addition, it also provided several suggestions on how to enhance the adoption of e-governance in health sector.
1. Introduction

E-governance means the utilization of internet and World Wide Web (WWW) for transfer of information and delivery of services from government to citizens. While information & communication technology (ICT) can be defined as a term that includes any communication device or application such as television, mobile phone, radio, computer and network hardware and software and satellite system which enable users to access, store, transmit and manipulate information. This system has certain benefits such as low cost, enhance service delivery, and increase in transparency and interaction between citizens and government (Sabri, Sabri, & Al-Shargabi, 2012). All stakeholders are benefited at the same time, public gets easy access to government information and government has the advantage of promoting, planning and making policies to resolve the community problems (Sarpoulaki, Rad, & Saleknia, 2008). The role of ICT is central in e-Government implementation, because citizens reach government services with the help of internet (Gajendra, Xi, & Wang, 2012; Salhofer & Ferbas, 2007). It is also important for governments to move towards e-Government and communicate with citizens and business persons. E-Government has the potential to reach people through different innovative ways. New technologies are being developed which allow electronic services to be utilized in e-Government (Sharma, Bao, & Peng, 2013).

Improvement in healthcare quality has become a prominent policy in less income countries (Barber & Gertler, 2008). It has been defined by institute of medicine as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.” Unfortunately, developing countries are unable to provide quality healthcare services due to lack of resources and funds (Barber & Gertler, 2008; Handayani, Hidayanto, Ayuningtyas, & Budi, 2016). Hospitals could utilize the healthcare technology such as Hospital Information System (HIS), which is a part of the e-health program (Sia & Soh, 2007). It is concluded by Hersh (2009) that the use of HIS in health sector can significantly improve its overall service delivery. Moreover, implementation of HIS does not merely mean introduction of new technologies but is also about managing the change in organization (Handayani et al., 2016; Piotti, Chilundo, & Sahay, 2006).

Pakistan is the sixth populous country of the world with a population of 195 million. The economy of Pakistan grows with 4.71% in 2016. Approximately about 29.5% of the population is living below the poverty line. Life expectancy for men is 65 years while for women it is 67 years. The literacy rate in the country is 60%. The mortality rates are; maternal mortality is 178/100,000, infant mortality rate is 66/1,000 and child mortality rate is 81/1,000 during 2015. The per capita income is US$1,560 (Government of Pakistan, 2016). Many studies have been reported in the domain of e-governance in Pakistan (Ovais Ahmad, Markkula, & Oivo, 2013; Rehman, Esichaikul, & Kamal, 2012; Soomro, Shukui, & Shaikh, 2015) but little effort has been put in the area of healthcare and e-governance and this study is planned to fill this gap.

In Pakistan, both the public and private health system works in parallel. The health sector was led by the federal ministry but has now been devolved to the provinces. This policy of the government increases the responsibilities of the provincial government, but still they are deficient of health workforce and facilities as compared to population. The private hospitals are playing a substantial role in the service delivery all over the country. Most of the clinics are operating in the urban areas and equipped with latest healthcare technologies. The demand for private health care is greater than public health care. The currently available ICT facilities in the health sector of Pakistan are, MIS for patients, biometric attendance system for doctors and other paramedical staff, online payment system for treatment through bank card, internet, computer and cell phone based appointment with doctor (Government of Pakistan, 2016).

The province of Khyber Pakhtunkhwa (KPK) has many issues and health is the major one. Every disaster that hit Pakistan has ruthlessly affected KPK such as terrorism, floods, droughts and non-availability of education has contributed to the deteriorating health conditions of the province. Terrorist attacks destroyed hundreds of hospitals and infrastructure and thus depriving the people
of its basic right to health. Both public and private hospitals work in parallel to provide health facilities to common masses (Government of Pakistan, 2016).

During the past few years, the telecommunication sector of Pakistan underwent several changes from market and regulatory perspective. New opportunities were opened after the introduction of Next Generation Mobile Services (NGMS), generally known as 3G and 4G LTE services. The cellular mobile operators continue to invest in the expansion and modernization of services and network. The Pakistan Telecommunication Authority (PTA) is looking for a smart Pakistan with the expansion of broadband services and development of ICT application in Pakistan. Peshawar is the capital of KPK province where almost all the people have access to 3G and 4G internet services.

This study is valuable as it explores the role of ICT and e-governance in health sector of district Peshawar KPK province of Pakistan. This study will be helpful to identify the level of awareness about ICT among patients in study area. Therefore, this study will enable the government to formulate policy for the health sector keeping in view the recommendations of this study. The main objective of this study is to investigate the role of e-governance in health sector of KPK province of Pakistan and how it might improve the service delivery to citizens. The specific objectives of the study are;

(1) To identify the current usage of ICT in health sector of KPK.
(2) To find the level of awareness about e-governance in health sector among patients.
(3) To identify the facilitating conditions for adoption of e-governance in health sector.
(4) To explore the role of government in implementation of e-health services in KPK.

2. Review of literature
The purpose of this literature review is to understand the concept of e-governance. In the literature there are two definitions of the concept, first presented by government and firms while the second published by the academia. According to World Bank (2007) e-governance means “the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions.” In academia it has been defined by Riley (2007) as “delivery of government services not only via internet but also via many non internet forms like fax, PDA, SMS, wireless network, Bluetooth, RFID, CCTV etc.” The only focus in all these definitions is on e-governance which seeks solution to governance related issues with the help of technology.

In other words e-governance can be defined as an interaction between people and government through the use of technology. Generally it is referred to the use of ICT and other web-based technologies and communication for the improvement of service delivery from government to people (Harris, 2000). The basic form of e-Government services are from government to citizen, government to employees, government to government and from government to business (Rossel, 2007). It should have the ability to empower people or employees to interact with government using different forms of ICT (Kaylor, Deshazo, & Van Eck, 2001). With the use of e-governance communication and interaction between government and people increases and so as their mutual understanding (West, 2006).

The country’s health progress can be traced from the share of its spending on health out of total GDP. There are various organizations, societies, individuals and foundations that provide finances to health sector besides government of Pakistan. However, the total spending on health sector has increased to 0.45% of GDP during the fiscal year 2016. According to the estimates of World Bank, the per capita spending of Pakistan on health is US$37 which is lower than the prescribed level of US $44 by World Health Organization (Government of Pakistan, 2016). Common people have complaints
about the way government delivers service to its people because this results in inefficiency and widespread malpractice and causes frustration among public. By incorporating e-governance into the government structure the economic conditions as well as the system will improve.

Health is an important indicator of income. Well (2007) is of the opinion that nearly 17–20% of variation between countries can be better explained by their difference in health conditions. Weil concluded that eliminating the differences in health sector among countries can decrease the variance of GDP per worker (in log terms) by approximately 9.9%. The impact of mortality rate (adult) on economic growth has been analyzed by Lorentzen, McMillan, and Wacziarg (2008). Their result indicates that economic growth is reduced significantly by mortality rate. It was found that investment in human capital and fertility are the two main factors which affect economic growth. In addition, they claimed that investment rate and school enrollment is negatively affected by mortality rate and positively by fertility.

Recently, a study has been conducted by Dao (2012) in which he examined the impact of government expenditures on economic growth in developing countries. He investigated 28 developing economies and concluded that the growth in per capita health expenditure has a positive impact on GDP per capita (Kumar & Singh, 2014). For example Thailand and Indonesia are developing countries. They are in the initial stages of e-Government implementation. An in-depth understanding of the perspective of citizens of these countries can help their government to shape their policies regarding e-Government and in this way can provide invaluable information to other developing economies. The result of the study indicates that important difference in perception of the citizens of Thailand and Indonesia is that in Thailand “the importance of financial transaction services is negatively related to the importance of citizen identification with the e-Government site whereas in Indonesia this relationship is insignificant” (Mirchandani, Johnson, & Joshi, 2008).

Similarly to achieve the objective of efficiency, transparency and accountability, the Kazakh government has initiated the implementation of e-Government. Results shows that this program of e-Government is facing several serious issues such as lack of political support, relationship between citizen and bureaucracy, digital divide, corruption, lack of human resource and insufficient infrastructure. The aforementioned issues have to be resolved to foster service delivery (Bhuiyan, 2010). A case study from Nepal can be presented, in which they studied e-Government implementation to provide different public services, citizen’s empowerment, accountability and transparency. It is expected that if e-Government is applied effectively in Nepal it can contribute positively to productivity of the public sector (Sharma et al., 2013).

E-Government was initiated in 2002 in Pakistan. The Electronic Government Directorate (EGD) was established under the umbrella of the ministry of science and technology to help in implementation of different e-Government projects, provide technical help and set a standard for infrastructure and software in the field. The purpose of e-Government is to increase the efficiency, transparency, responsiveness and effectiveness of the public sector through the introduction of ICT to serve citizen (Ahmad, Markkula, & Oivo, 2013). Currently the Pakistani government mainly focuses on ICT. Pakistan is in the initial stage of ICT development. The government is striving hard to create a dynamic and practical approach to modernize the lives of all citizens. Keeping this in mind, several policies were formulated by the government of Pakistan to develop a competitive ICT sector and provide improved services to its entire population (PTA, 2011). According to National Database and Registration Authority (NADRA) and PTA (2011) some of the initiatives of the government of Pakistan for the development of ICT infrastructure includes, cellular village connection, national rabta information portal, and NADRA kiosk and e-Pakistan vision 2020 (Ahmad et al., 2013). The rate of teledensity experienced a growth rate of 12.1% reaching to 70.4% during the fiscal year (FY) 2016. The key drive for this increase was growth in cellular mobile subscribers. Similarly, the number of broadband subscribers rose to 30.99 million at the end of March, 2016 showing a growth of more than 83% (Government of Pakistan, 2016). A recent study indicates that e-Government in Pakistan is still in the initial phase (Haider, Shuwen, Lalani, & Mangi, 2015).
Pakistan is facing challenges like other developing countries such as poor IT infrastructure, low rate of literacy, slow development of e-Government services and adoption (Rehman et al., 2012), lack of awareness about e-Government services, lack of trust by the people on government and internet facility (Rehman et al., 2012). In addition, Kayani, Haq, Perwez, and Humayun (2011) reported that there is insufficient access to internet as well as limited security and lack of IT policies implementation. Literature revealed that implementation of e-Government projects need strong commitment from the top level management for smooth execution and completion. In case of case of Pakistan there is resistance in funds releasing from the top management that obstruct the process of development as reported by Qaisar and Khan (2010). Moreover, political instability also hinders the project. In some cases projects are changed or stopped where there is a change of government Therefore, there is a need to enhance the adoption rate of e-Government in Pakistan (Rehman et al., 2012).

3. Methodology and data

3.1. Description of the study area

This study was conducted in district Peshawar, capital of KPK province Pakistan during December-January, 2016/2017. The city lies between 34°01′ N and 71°35′ E. The total area of Peshawar is 1,257 km². The total population of district Peshawar is 2,019,118 (KPBOS, 2016). Peshawar is a growing city and economic hub for all surrounding areas. It is the largest city with respect to population in whole KPK and several public and private hospitals are there. The government is also focusing to invest in this sector to provide better health services because these hospitals not only have to accommodate its own people but also patients from the entire province because all the major health care facilities are available here. Anyone who wants better health services would visit Peshawar. There are approximately 47 hospitals in Peshawar out of which 17 are government run while 30 are private (KPBOS, 2016). The government of KPK has undertaken various reforms in health sector to ensure provision of quality health service to every citizen. The program of independent monitoring units (IMUs) have been started to ensure presence of hospital staff, provide medicine and availability of medical equipment. Moreover, Sehat Sahulat program (Health facilitation program) is also started in which financial support is provided to the marginalized segment of the society.

3.2. Data collection

Stratified random sampling technique is applied to collect data. This technique of data collection is good because it will reduce the sampling error. First the hospitals (stratum) were identified from which data has to be collected and then simple random technique is used within each stratum to collect data (Bart, Michael, & William, 1998). A structured questionnaire was administered through face to face interview. The total numbers of respondents cover were 170. This survey collected quantitative data relating to socio-economic, demographic, awareness about e-governance, role of e-governance in health sector, facilitation condition for e-governance adoption and suggestions on how to implement e-governance in health sector.

3.3. Statistical analysis

This research is planned to investigate the role of ICT and e-governance in health sector of KPK Pakistan. More specifically this study tries to find the level of awareness of e-governance among patients. This study will use both types of data i.e. primary and secondary. For analysis of the data simple descriptive statistical techniques will be utilized such as frequency, mean, standard deviation and percentages. For data collection survey method is utilized. For this purpose, first hospitals in district Peshawar were identified and then questionnaires were randomly distributed among patients. The data collection was completed between December 2016 and January 2017. Simple language was used for the designing of questionnaire so that everyone can easily understand and it is tried to avoid technical terms because majority of the patients belong to low income groups, having low level of education. In the design of the survey three criteria were considered important. First, it was not a restriction that patient should only belong to district Peshawar he/she may belong to any district of KPK. Second, patients should be above 18 years of age. Third, respondents from rural and urban areas will both be considered. Before collection of data they were given a brief introduction of
e-governance and what might be its role in enhancing the health facilities to the general public. A total of 170 respondents were covered in this study keeping in view the financial and time constraints. The purpose of this research is to contribute to the literature of e-governance on health sector by providing evidence from district Peshawar KPK Pakistan. The results of this study cannot be generalized to other provinces of Pakistan or country rather it is limited only to northern area of Pakistan (District Peshawar).

4. Results and discussion

4.1. Demographic characteristics of the respondents
The socio-economic and demographic characteristics of the respondents are shown in Table 1. Most of the respondents were male about 67.6 and 32.4% were female. This was due to the ethical consideration because in the study area it is not deemed appropriate for a female to be interviewed by a male and there were a shortage of female enumerators. The majority of the respondents were young. Their age wise distribution were less than 20 (7.1%), 20–29 (67.1%) and 30–39 (25.9%). In terms of household size respondents have big families as they consider it as an economic asset, the distribution was 5.9% have 2–3 family members, 44.7% have 4–5 members, 29.7% have 6–7 members and 20.0% have 8–9 members. The education level of Pakistan is not very impressive. The literacy rate is only 60% (Government of Pakistan, 2016). However, our sample consists of educated people about 32.4% have college education and 67.1% have graduation. People from both urban and rural area were considered. About 45.3% were urban and 54.7% were belonging to rural areas. KPK is a low-income province and majority of the people either work outside of the country or earning their livelihoods from agricultural sector. Only 6.5% were businessmen, 63.5% were university students, 5.3% farmers, 12.4% government servants and 12.4 were daily wagers. Similarly, income of the respondents varies from one socio-economic group to other. About 24.1% have income below 10,000, 20.0% have 10,001–20,000, 18.2% have 20,001–30,000, 12.4% have 30,001–40,000, 18.2% have 40,001–50,000 and 7.1% have 50,001 and above level of income.

4.2. Use of e-governance in health sector of KPK Pakistan
Pakistan is a developing country. The development of ICT is currently at an early stage. The main purpose of e-Government is to modernize the economy and increase efficiency, responsiveness and effectiveness of service delivery system (Ahmadi et al., 2014). In this study respondents were asked various questions about their level of understanding of e-governance in health sector. Figure 1 shows that almost 72% of the respondents collect their diagnostic reports through personal visit and only about 28% use e-mail for this purpose. Similarly fixing appointment with doctor is mostly done through personal visits as about 56% indicated this while 24% use mobile and 20% use e-mail for this purpose as shown in Figure 2. Similarly, Figure 3(i)–(iii) shows the results of various questions asked from respondents, like they were asked about the use of internet for medical information, use of e-governance, and what type of e-governance service they like. As the figure shows that about 41% of the respondents did not use computer for obtaining medical information, about 18% use once a month, 27% % use once a week and only 14% uses it daily for getting related medical information. Moreover, the figure indicated that about 61% of the respondents do not use e-governance and only 39% use it. In addition, most of the respondents were of the opinion that if they were provided e-governance services, it should be cell phone based (about 61% because it is easy for them to access and handle. Moreover, the service will be quicker and efficient. Figure 4(i)–(iv) indicate the result of questions asked from the respondents e.g. the role of e-governance in health sector of KPK Pakistan. They were of the opinion that e-governance in health sector is the need of the day as approximately 88% of the respondents prefer this. About 81% of the respondents’ think that using e-governance in health sector is suitable for them. It is stated that learning e-governance in health sector would be time consuming as 64% of the respondents replied positively. Nearly 76% believe that with the introduction of e-governance in health sector the process of diagnostic and treatment would improve and speed up respectively. The findings of this study is in line with (Buntin, Burke, Haqgin, & Blumenthal, 2011; Chaudhry et al., 2006; Hillestad et al., 2005; Howley, Chou, Hansen, & Dalrymple, 2015; Menachemi & Brooks, 2006) they stated that adoption of e-health has many
Table 1. Demographic and socio-economic characteristics of the respondents

| Variables          | Frequency | Percentage |
|--------------------|-----------|------------|
| Gender             |           |            |
| Male               | 115       | 67.6       |
| Female             | 55        | 32.4       |
| Age                |           |            |
| Less than 20       | 12        | 7.1        |
| 20–29              | 114       | 67.1       |
| 30–39              | 44        | 25.9       |
| Household size     |           |            |
| 2–3 m              | 10        | 5.9        |
| 4–5 m              | 76        | 44.7       |
| 6–7 m              | 50        | 29.4       |
| 8–9 m              | 34        | 20         |
| Education          |           |            |
| College            | 55        | 32.4       |
| Graduate           | 114       | 67.1       |
| Diploma            | 1         | 0.6        |
| Area               |           |            |
| Urban              | 77        | 45.3       |
| Rural              | 93        | 54.7       |
| Occupation         |           |            |
| Businessman        | 11        | 6.5        |
| University student | 108       | 63.5       |
| Farmer             | 9         | 5.3        |
| Govt servant       | 21        | 12.4       |
| Daily wage         | 21        | 12.4       |
| Monthly income     |           |            |
| Below 10,000       | 41        | 24.1       |
| 10,001–20,000      | 34        | 20         |
| 20,001–30,000      | 31        | 18.2       |
| 30,001–40,000      | 21        | 12.4       |
| 40,001–50,000      | 31        | 18.2       |
| 50,001 and above   | 12        | 7.1        

Figure 1. Collection of medical reports.
Figure 2. Fixing appointment with doctor.

- Personal visit: 56%
- Mobile: 24%
- E-mail: 20%

Figure 3. (i) Use of internet for medical information, (ii) Use of e-governance, and (iii) Type of e-Governance service citizens like.

(i) Use of internet for medical information:
- None: 41%
- Daily: 14%
- Once a week: 27%
- Once a month: 18%

(ii) Use of e-governance:
- Yes: 39%
- No: 61%

(iii) Type of e-Governance service citizens like:
- Cell phone based: 61%
- Web based: 39%
4.3. Awareness about e-governance in health

E-Government implementation has increased in many countries but their adoption rate differs from one country to another. Generally, developing countries are lagging behind in adoption of e-Government services as compared to developed nations (West, 2006). For the successful implementation of e-governance strong political leadership is required. In a country with multi-political party system, the role of a leader is inevitable. To fully utilize the power of social media the role of a leader and his policies is crucial (Bonsón, Torres, Royo, & Flores, 2012). To enhance transparency, reduce corruption and increase participation of public revolution the use of e-governance is necessary (Kumar & Best, 2006). Currently, Pakistan is facing several problems in implementation of e-governance such as low literacy rate, slow development of e-Government services and poor IT infrastructure. Respondents were asked whether there is a need for implementation of e-governance in health sector and about 94% believe that yes there is a need for this implementation. In addition, respondents were asked whether they will feel any resistance while changing from paper based to e-health system. Interestingly, nearly 69% believe that they would feel resistance to this change. The internet usage

Figure 4. (i) E-governance in health sector is the need of the day, (ii) Using e-governance in health sector is suitable for me, (iii) Learning e-governance in health sector is time consuming, and (iv) Process of diagnoses and treatment would speed up with e-governance.
pattern shows that about 33% of the respondents were online every time, 32% uses internet once in day and nearly 35% uses it occasionally. The results are given in Figure 5(i)-(iii) respectively.

4.4. Facilitating conditions for adoption of e-governance in health sector

The rapid development of ICT has a transformative effect on society (Al Hujran & Chatfield, 2008). Investment in ICT is considered one of the significant factors that can contribute to the development of entire economy (Haluza & Jungwirth, 2015). Many governments are able to deliver information in an efficient way to citizens, employees, businessmen and government agencies. The development of e-Government may improve the delivery of public services that improves accountability, transparency and governance (Al Hujran & Chatfield, 2008). The aim of this study is to explore the role of ICT and e-governance in health sector of KPK Pakistan. The results are given in Figure 6. Infrastructure is the major requirement for e-governance in health sector as it is considered most important for adoption of e-governance by approximately 58% of the respondents. Similarly electric power is needed to run electric appliances and currently economic growth and development is not possible without sufficient availability of electricity to all sectors of the economy. About 81% of the respondents considered it to be the most important condition for e-governance adoption. Furthermore, proper user interface is necessary as 45% of the respondents considered as in important factor. Nearly 64% of the respondents claimed awareness and guidance is necessary for technology
adoption. If people are unaware of a particular technology they will not be able to use it. Another, most important factor for e-governance adoption is data privacy and confidentiality. If people are assured of their privacy, they will be convinced to use the system. Almost 47% of the respondents claimed it to be the most important factor for the adoption of e-governance in health sector. The findings of the study are in conformity with (Zambrano, 2008) who claimed that citizens play a key role in the design and implementation of polices related to e-governance (Goel, Dwivedi, & Sherry, 2012). In addition, many international organizations such as United Nations, World Bank and international monetary fund are working with many African nations to sponsor the adoption of e-governance to improve transparency and accountability of the public sector.

4.5. Government role in implementation of e-health service in KPK

The availability of human resource plays a key role in health system of a country. With respect to Pakistan, the federal and provincial departments of health are distributed on this important issue; they do not have a specific and long term policy for the development of human resource. There is fragmentation in health system. Each individual program has its own information system. With the passage of time, population is increasing which is accompanied by various issues including poor housing, pollution, poor diet and lack of exercise. The health system of Pakistan is facing several key problems such as inequality, resource scarcity, unskilled human resources, gender issues and mismanagement (Din, 2006). The economic situation of Pakistan is vulnerable and health system specially needs structural reforms (Islam, 2002). Frequent change in government has led to change the health policy which further deteriorates the health condition of the country. Health sector has been ignored approximately by all governments and only a meager portion of GDP has been allocated to this sector (Khan & Van den Heuvel, 2007). Figure 7(i)–(iv) shows the results of the questions respectively. Respondents have been asked how much money government should spend on the development of e-Government services. Approximately 73% of the respondents suggested that government should spend enough to provide better services. In addition, they were asked will e-governance improve the public service delivery system. Nearly 75% of the respondents believe that it will improve the service delivery. Moreover, respondents were optimistic about improving the accountability in e-health system. About 82% believe that e-health will improve accountability. In case of transparency, almost 71% believe that transparency will be improved in e-health system. The government of KPK has initiated many such projects in health sector. Recently they have installed biometric system in all public hospitals to ensure the presence of the staff. Respondents believe that government has started few projects to improve health services and implement e-governance in health sector of KPK.
Pakistan which is a good step and they were hopeful that government will start more such projects in the future.

There is a difference between public and private owned hospitals with regard to institutional process. The management of government hospitals is more vibrant and motivated towards HIS implementation, while the management of private hospitals considers HIS a much needed requirement (Handayani et al., 2016). The performance and services provided by a hospital can be significantly improved with the proper adoption of information technology (IT) (Ahmadi et al., 2014; Costa, de Oliveira, & de Oliveira Machado, 2004; Hung, Chou, & Tzeng, 2011; Lee, Ramayah, & Zakaria, 2012). The HIS consists of an integrated information system (IS) designed to manage the administrative, financial, and clinical aspects of a hospital. HIS is efficient, reduce errors, cost effective, and
enhances health services (Kim, Lee, & Kim, 2002; Sulaiman & Wickramasinghe, 2014; Zhang, Patel, & Johnson, 2002). Moreover, the main purpose is to remove the manual process because now that is seen as a major obstacle in the way of providing effective health services (Sulaiman, 2011). The main challenge in the implementation of IS system is the handling of information (Costa et al., 2004). Despite the fact that technology has improved substantially over the last few years’ still both developing and developed countries are facing many challenges in its adoption (Ahmadi et al., 2014).

4.6. Suggestions to improve e-health services

The healthcare system in Malaysia consists of both private and public sector hospitals. However, government hospitals cover most of the rural areas (Sulaiman, 2011). The government of Fiji has invested in ICT and increased budget allocation to enhance the deteriorating health conditions and improve the situation of the economy (Kumar & Singh, 2014). It is learned from Denmark that successful implementation of e-health needs a committed and transparent coordination among all stakeholders. It is important that responsibilities should be distributed among those who understand the needs of the patients from a local, regional and international perspective. It is necessary that all healthcare professional, patients and vendors should be included in decision-making to ensure the well being of patients and avoid political intervention (Kierkegaard, 2015). Results are given in Figure 8(i) and (ii). Some steps are suggested by the respondents to improve the health services in Pakistan. It is suggested that child birth should be registered with union council office. Community health services are provided by the local government in every village, it has been suggested that this service should be made on line as about 81% of the respondents believe in this. Moreover, to increase efficiency and transparency public private working relations should be encouraged. Approximately 86% of the respondents claimed that this relation should be improved to increase efficiency. Figure 9(i)–(iii) shows that on line games should be introduced to educate people about community health. Almost 75% believe that on line games should be introduced to educate people. Moreover, respondents were asked what language should be used for providing e-health services. Approximately 32% claimed Pashto should be used to provide e-health services. Nearly 43% claimed Urdu should be used. Most of the children used to watch cartoons every morning before they go to school, therefore, it is suggested by the respondents that special cartoons should be introduced to incorporate the concept of e-health services in them. It would be better for the community as a whole. About 92% of the respondents believe that this idea should be incorporated respectively. It is indicated by several studies that the use of ICT and e-governance leads to reduce corruption and enhances transparency (Armantier & Boly, 2011; Bertot, Jaeger, & Grimes, 2010; Dutt, 2009; Ionescu, 2013; Krishnan & Teo, 2012; Marquette, 2012). Greater engagement is achieved in policy formulation, implementation and evaluation (Bertot et al., 2010). The use of e-governance also improves interaction between government and citizens (Armantier & Boly, 2011; Dutt, 2009). In addition, it empowers citizens by providing them access to information.
5. Conclusion

The implementation of e-governance in health sector can potentially increase efficiency, transparency and accountability. The successful implementation of e-governance in health sector is facing many challenges. Studies on e-health should not only be limited to the use of technology rather government policies, structural reforms and acceptability by the general public are necessary for the successful implementation of e-governance in health sector.

This study utilized survey methodology to explore the role of e-governance in health sector of KPK Pakistan. It is suggested that government needs to take practical steps for the successful implementation of e-governance in health sector. They need to provide full information, data privacy, infrastructure and cost effective services to public. Moreover, the role and cooperation of the general public is also necessary.
5.1. Key challenges

Some key challenges that government would face in implementation of e-governance in health sector are as follows:

(1) It needs huge amount of up-front investment cost. The benefits of which may occur after some time.

(2) Health is a low spending sector in Pakistan. Sincere and committed leadership is required for the successful implementation of e-governance in health sector.

(3) Data privacy and confidentiality would be a big challenge for health authorities.

(4) Providing equal access to all citizens of the country is a challenge in itself.

(5) Government sector projects are always prone to corruption.

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