Journal of Computer Science and Technology Studies
ISSN: 2709-104X
DOI: 10.32996/jcsts
Journal Homepage: www.al-kindipublisher.com/index.php/jcsts

JCSTS
AL-KINDI CENTER FOR RESEARCH AND DEVELOPMENT

| RESEARCH ARTICLE

Exploring Saudi Arabia Individuals' Attitudes toward Electronic Personal Health Records

Anas Ali Alhur
Health Informatics Department, College of Public Health and Health Informatics, King Saud bin Abdulaziz University for Health Sciences (KSAU-HS), Riyadh, Saudi Arabia
Corresponding Author: Anas Ali Alhur, **E-mail**: alhur12014@ksau-hs.edu.sa

| ABSTRACT
This study is one of the few studies that examined the perspectives and expectations of Saudi Ariba patients regarding ePHRs. Participants expressed a greater interest in ePHRs than participants in other studies in developed countries. The majority of participants would like to use ePHRs at least once per month. Moreover, respondents believe that ePHRs help access images and blood test results, and information about the devices they use to track their health. For example, the blood glucose checkers. The study also pointed out that ePHRs are perceived as valuable to patients' health. However, some patients expressed concerns regarding the security of their online records. However, the vast majority of patients viewed ePHRs as enhancing patient privacy. The individuals desire access to information about their health contained within their ePHRs, including medication lists, doctor lists, medical conditions, and surgical histories. The respondents indicated that they are currently performing some tasks electronically, such as requesting appointments, reports, and medication refills, and referring patients through ePHRs, at an acceptable rate of 42.1%. Further research is needed to assess the quality of data entered, validity, and accuracy of the ePHR.

| KEYWORDS

Electronic Health, Personal Health Records, Individuals' Attitudes, Online Personal Health Records**.**

| ARTICLE DOI: 10.32996/jcsts.2022.4.1.10

1. Introduction

Saudi Arabia's efforts in the field of eHealth (electronic health) have shown continual growth in both publications and awareness of its importance. Thus, ePHRs (personal health records) have gained popularity worldwide. However, many people have difficulty accessing and organizing their health data efficiently, emphasizing the demand for investigating multiple aspects of the ePHR and individuals' perceptions. Different ePHRs are being discussed, developed, and introduced to the market by providers, payers, and third-party organizations, like Google, which is not typically involved in healthcare. PHR is defined as "An electronic application through which individuals can access, manage, and share their health information and others for whom they are authorized, in a private, secure, and confidential environment. (Group, 2003)" A wide variety of personal health records exist, ranging from stand-alone records that operate independently of other systems to tethered records that integrate with other health information systems (Tang et al., 2006). The patients with tethered personal health records are connected to a specific healthcare provider or institution, and the integrated Personal Health Records (PHRs) are connected to the provider's Electronic Medical Records (EMR) and are interoperable with other systems, allowing access to the patient's medical record as documented by the provider and providing patients with the option to share that information with others (Nazi et al., 2013)

2. Literature Review

Generally, there are multiple benefits of ePHR, including that both patients and caregivers will be able to receive information, schedule appointments, request refills, and report problems with enhanced communication(Gandhi et al., 2003). Moreover, patients with chronic diseases will significantly benefit from the ePHRs (Walker et al., 2005). The ePHRs allow patients and providers to build a better relationship, empower the patient, and improve healthcare quality, safety, efficiency, and coordination (Fetter, 2009). It can store a wide variety of data, including laboratory results, radiology images, and home measurements of blood glucose and blood pressure(Vance et al., 2015). An ideal ePHR has to perform multiple functions to be adopted by consumers(Genitsaridi et al.,

2015). Including web-based personal health, records are flexible, interoperable, and do not require installing or downloading additional software(Archer et al., 2011). The ePHR has been shown to have a great deal of potential to promote quality healthcare and reduce healthcare costs (Detmer et al., 2008; Green et al., 2008). In order to reduce healthcare costs, organizations are hoping that providing consumers with more information and guidance about health may allow them to manage their health better, thus improving the quality of healthcare(Abaidoo & Larweh, 2014).

Additionally, physicians have demonstrated that ePHRs can provide patients with problem lists, clinical notes, medication information, and laboratory and diagnostic test results(Halamka et al., 2008). Patients and providers can benefit from using PHRs to reduce the amount of information lost in verbal communication (Versel, 2011). A study indicated that ePHR users are young and tend to have higher incomes and educational levels(Tenforde et al., 2012). Furthermore, ePHR users with multiple chronic conditions have taken more steps to improve their health than other PHR users(ZIEGER, 2010). By having access to an online PHR, patients gained more trust and confidence in their physicians(Fisher et al., 2009). Most respondents find that ePHR is vital or highly important when sharing medical records electronically(Patel et al., 2012). Among rural physicians and hospital employees, ePHR usage rates were significantly higher(M. K. Wynia et al., 2011). Moreover, ePHR enables healthcare providers to exchange information and conduct transactions, including refilling prescriptions and scheduling appointments(Cushman et al., 2010). Patient health records are a valuable resource for patients looking for more health information and guiding essential health decisions(Pagliari et al., 2007).

(Kim et al., 2009). Despite the lack of scientific evidence to support the benefits of electronic personal health records, the literature reviewed indicates that these records could offer numerous advantages when developing new models of care that involve patient involvement(Czaja et al., 2015). A significant benefit that ePHRs could have on the healthcare industry is improved patient-provider communication(Noblin et al., 2012). Researchers found that 74% of physicians believed that ePHRs could enhance patient safety (Heise et al., 2011). Moreover, Wynia, Torres, and Lemieux (2011) conducted a study on physicians' perceptions of ePHRs, which found that 53% of the physicians indicated that it contributed to improved patient care(M. Wynia & Dunn, 2010). Furthermore, various studies have indicated that ePHRs can reduce errors and improve patients' experiences in healthcare(Chang et al., 2004). An investigation conducted in Saudi Arabia revealed that the majority of respondents indicated the availability of the internet and technology as a positive indicator for potential ePHR adoption(HI, 2016).

The ePHRs, on the other hand, have some issues that require immediate attention, including privacy and security concerns, costs, integrity, accountability, health literacy, and legal and liability risks(Señor et al., 2012). A study concluded that low-income elderly individuals who had inadequate technical skills, poor health literacy, and limited physical and cognitive abilities could not fully use electronic personal health records (Kim et al., 2009). Another possible downside of ePHR is that it may negatively affect the relationship between providers and patients based on some respondents' perceptions (Yau et al., 2011). 31% of patients did not believe that the information in their ePHR was confidential, according to Kahn et al. (2010) (Kahn et al., 2010). Because paper-based records are physically stored somewhere, there is relatively little risk of privacy invasion, unlike ePHR, which might be electronically shared across different locations(Kaelber et al., 2008). Moreover, researchers found that some studies showed concern about the privacy and security of personal health records, particularly for stigmatized conditions such as HIV(Kahn et al., 2010; McInnes et al., 2011). Patients may be discouraged from using personal health records that do not allow them to control or filter shared information(Cushman et al., 2010). Adopting ePHRs has been as low as 10% (Kannry et al., 2012). Successful implementation of ePHR technology depends on the acceptance and adherence of the user. There is also the risk of health data being misused by entities with financial interests (Sarwal & Gupta, 2021). The ePHR platforms should provide a secure environment for exchanging medical information(Cushman et al., 2010). The current study examines Saudi Arabi individuals regarding electronic personal health records.

2.1 Research question :

1-What are the Saudi Arabia population's perceptions of the electronic personal health record?

3. Methodology

A cross-sectional study was conducted. A total of sixteen items were included in the survey, and the results obtained were entirely consistent with the study's objective. There were two sections to the survey: two items regarding demographic information and fourteen items regarding perceptions of personal health records. We gathered information regarding personal health records during the second part of the survey.

This investigation is being conducted on how individuals perceive the adoption of ePHRs, and issues should be identified. In 2021/1/3, the survey was distributed to the population and individuals with various characteristics, such as gender, age, and location, aiming to gain generalizable knowledge.

3.1 Statistical analysis

It was reviewed numerous times to ensure the validity and accuracy of the data collected. Using descriptive statistics, we examined the perceptions and experiences of the random sample targeted. A categorical variable is a percentage or frequency, while a continuous variable is a mean or median. SPSS performs statistical analysis.

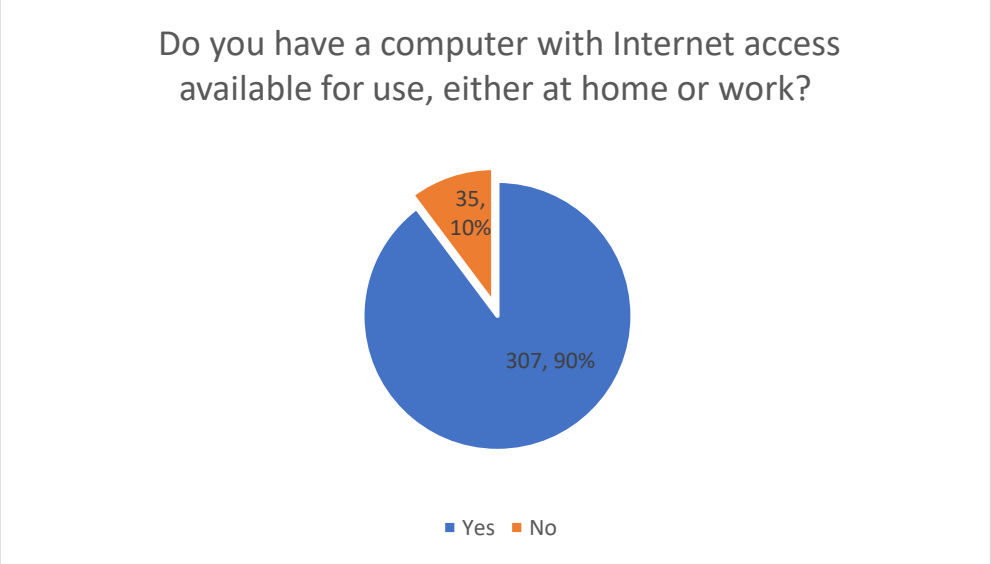
4. Results and Discussion

An online survey was sent to 580 individuals, of whom 403 responded. The researcher eliminated 62 incomplete responses from the 403 respondents. There were 341 surveys included in the survey analysis. There were 341 respondents, including 230 females and 111 males. Concerning age, 180 respondents were between the ages of 20 and 30, and 88 respondents were between 15 and 20. 307 (90%) reported computer and internet availability among the participants. Furthermore, 82.8% totally agreed and indicated regular internet access.

Table 1. The Frequency of the Demographic Data

Variable	Categories	Frequency	Percent
Gender	Male	111	32.4
	female	230	67.4
	Total	341	100.0
Age	from 15 to 20	88	25.8
	from 20 to 30	180	52.8
	from 30 to 40	53	15.5
	from 40 to 50	19	5.6
	from 50 to 60	1	.3
	Total	341	100.0

The first pie chart demonstrated the availability of the internet in-home or at work. Of 342 participants, 307(90%) could access the internet, and only 32 (10%) claimed otherwise. This increase in internet usage may be due to a variety of factors. Since Saudi Arabia's internet coverage has increased tenfold in the last decade, over 90% of the country's population has no access to the internet. The availability of electronic devices (including smartphones, tablets, and computers) is widespread among adolescents(Saquib, 2020).



As demonstrated below in table2, 89.8% fall between strongly agreed and agreed that they continuously access the internet (د. More than half of the participants, 52.9%, indicated an interest in using ePHR on the internet. 69.9% of the respondents demonstrated that ePHR would improve the security and privacy of their medical information, and just 3.8% strongly disagreed. Moreover, a large portion (70.2%) believed that ePHR would improve the communication between healthcare providers with individuals. Due to information and communication technologies (ICT) and trends moving towards patient-centred care, the public has grown increasingly interested in managing their personal health information(Pagliari et al., 2007). Only 6.8% of the participants did not agree that the overall quality would increase. An ePHR allowed patients to receive significantly better medical care and use medical services more frequently. Also, personal health records may offer a relatively low-cost, scalable solution to patients with severe mental illnesses and medical comorbidities(Druss et al., 2014).

However, 67.3% considered ePHR one tool for decreasing their overall healthcare cost. Consumers in the United States have high expectations for electronic health records. Eight out of ten consumers believe that electronic medical records will improve healthcare quality, and six out of ten believe that electronic medical records will reduce medical errors and lower healthcare costs(Ball & Gold, 2006).

Table 2: Participants' Perceptions on ePHR

No.	Item	Scale					Mean	Standard Deviation
		(1)	(2)	(3)	(4)	(5)		
1.	I am continuously access to internet	82.2	7.6	4.1	2.6	3.5	2.50	.948
2.	I am interested in using personal health records on the internet to view my health information and manage my healthcare.	24	28.9	37.7	5.6	3.8	2.36	1.026
3.	The security and privacy of my medical information will improve	43.9	26	15.8	10.8	3.5	2.04	1.161
4.	Communication between my doctors and myself will improve	45.6	24.6	13.7	11.7	4.4	2.05	1.208
	The overall quality of my healthcare will improve	40.1	29.2	24	5	1.8	1.99	1.000
5.	The overall costs of my healthcare will improve	39.5	27.8	23.7	5.3	3.8	2.06	1.088

Note: 1: strongly agree, 2: agree, 3: neutral, 4: disagree, 5: total disagree, f=frequency

According to the researcher from table3, percentages represent the respondents' opinions: 1- I am doing it online 2- I am considering doing it online 3- I will not do it online. The first activity was viewing test results, medication lists, and medical records. Sixty-three percent of respondents prefer to perform this activity online. According to the second item, 67.5% of respondents favour adding comments via the internet, and 17.5% do not. Currently, 42.1% of participants are making requests for medical appointments, referrals to other doctors, and prescription refills online. The majority of respondents (63.5%) prefer to communicate with their doctors by e-mail and receive reports from them.

Table 3: Participants' Preferences Regard the ePHR

No.	Item	Scale			Mean	Standard Deviation
		(1)	(2)	(3)		
1.	View my medical records, test results, and lists of medications I am taking.	23%	60.3%	16.7%	2.17	.373
2.	Add notes to my medical record.	15.1%	67.5%	17.5%	2.18	.383
3.	Request medical appointments, referrals to other doctors, and prescription refills.	42.1%	51.6%	6.3%	1.65	.603
4.	Communicate with my doctor and/or receive reports from my doctor by e-mail.	23%	63.5%	13.5%	1.91	.597

Note: 1: - I'm doing this online now, 2 - I would like to do it online, 3: - I wouldn't do this on the internet,

As seen from the table. 4 below the respondents demonstrated that 81.1% percent prefer to have their test results on the internet, whereas only 38.1% are interested in having information concerning their lifestyle health, such as exercise and smoking. Moreover, the item 2 vaccinations and item 3 previous and current medications were 56.3% and 50.8%, respectively. Additionally, the List of doctors and healthcare providers I visit is 40.5%, and the family medical history is around half of the participants, 46.8%. 42.9% indicated the prioritization of having medical visits, including emergency visits. The last item concerning information from the devices they use to organize their health, such as the blood glucose checker machine, reached 57.1%. Patients with chronic illness, frequent healthcare users, and those caring for elderly parents were the most likely to use PHRs (Ball et al., 2007).

Table 4. Health information that respondents like to have as part of your personal health record

No	Which of the following types of health information would you like to have as part of your electronic personal health record? Please check all that apply:	Percentage
1	Test results (e.g., laboratory and radiology)	*81.1%*
2	Vaccinations	*56.3%*
3	Previous and current medications	*50.8%*
4	List of doctors and health care providers whom I visit	*40.5%*
5	Family medical history	*46.8%*
6	My medical visits, including emergency visits	*42.9%*
7	My lifestyle health (e.g., exercise and smoking)	*38.1%*
8	Information from the devices that I use to organize my health, such as the blood glucose checker machine	*57.1%*

The researcher collects the data from participants regarding some types of activities they performed on the internet to determine the most and most minor activities conducted. Both the first and the second items were sent and received E-mails, and if they bought something online with a credit card, the results demonstrated that both items 1and 2 were the same by 77,8%. This was

followed by item four, which says I searched for information on health and diseases by 74.6%. Nevertheless, the internet provides consumers with access to credible scientific and institutional resources and unreviewed sources with questionable credibility (Gregory-Head, 1999). Furthermore, digital tools have improved health outcomes, and smartphone use has increased internet access (Hilfiker et al., 2019). The last statement was about if the respondents paid bills and/or online managed bank accounts; the analysis shows that 57.9% of them did this type of activity online.

Table 5. Participants' Activities on the Internet

No	Which of the following activities have you done on the internet? Please check all that apply:	Percentage
1	Sent and Received E-mails	*77.8%*
2	You bought something online with a credit card	*77.8%*
3	Paid bills and/or online managed bank accounts	*57.9%*
4	I searched for information on health and diseases	*74.6%*

The pie chart would represent the percentage of individuals' primary sources of information if they were from newspapers, TV, radio, and the internet. The internet was the most significant proportion of the other media by 97% of the participants. Although, 48.1% of participants in a recent study of 8,302 people regularly used social media as a source of information about COVID-19 (Brailovskaia et al., 2022). 2% used the TV as the primary source of information, and only 1% reported the radio. Surprisingly no respondents illustrated that newspapers as a source of information. A survey conducted among Saudi Arabian students revealed that participants were knowledgeable and encouraging about the ways to reduce their risk of contracting COVID-19. Additionally, students' sources of information indicate that they receive the majority of their knowledge from social media rather than newspapers or television(Sharanesha et al., 2021).

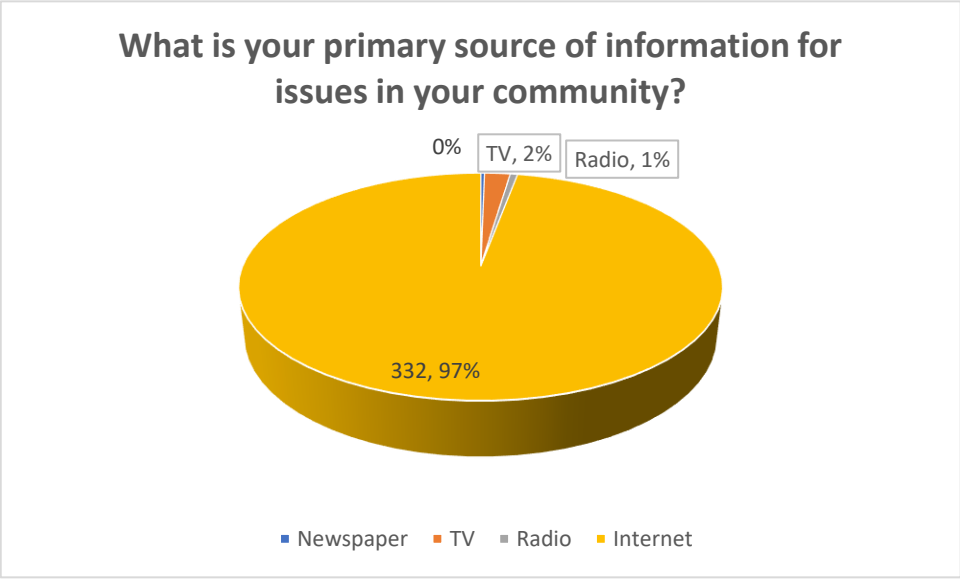


Figure 1: Respondent's Sources of Information

5. Conclusion

This study is one of a few that investigated the attitudes and expectations of Saudi Ariba patients regarding ePHRs. In comparison with other studies conducted in developed countries, participants in this study were more interested in ePHRs. The majority of

participants were interested in using ePHRs at least once a month. Furthermore, respondents believe that ePHRs help access imaging and blood test results and information from devices they use to manage their health, such as blood glucose checkers.

Additionally, they desired to access information related to their health in their electronic health records, such as medication lists, doctor lists, medical conditions, and surgical histories. Furthermore, respondents indicated a good rate (42.1%) of performing some tasks currently electronically, such as requesting medical appointments, reports, medication
refills, and referrals through ePHRs. Based on the findings of this study, ePHR is perceived as offering high levels of benefits to individuals. Some patients expressed concern about the security of their online information. However, most patients believed that ePHRs would increase the privacy and security of healthcare data.

Healthcare continues to benefit from adopting ePHRs by organizations, such as hospital networks, large physician practices, insurance companies, and other software providers not typically associated with healthcare, as consumers become more familiar with them as technology advances and costs decrease. The use of personal health records (PHRs) in the healthcare industry will continue to increase. Our results indicate that most respondents give a positive opinion of the ePHRs. ; however, we cannot wholly substantiate or generalize the acceptance of the ePHRs for all populations. The researcher believes the community will become more motivated to use these electronic tools by conducting this research. Interested researchers and medical institutions may also consider investigating other aspects of the topic and evaluating its effectiveness. Furthermore, our findings suggest that a more comprehensive investigation of security and privacy is necessary. Furthermore, the analysis presented in this study provides valuable information for future research that will explore in greater detail the components of ePHRs. Researchers should examine the long-term effects of the ePHRs if it is implemented. The questions that require answering are what type of data should be compatible with the ePHRs, and who should be authorized to access them.

Funding: This research received no external funding.

Conflicts of Interest: The author declares no conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers.

References

[1] Abaidoo, B., & Larweh, B. T. (2014). Consumer health informatics: The application of ICT in improving patient-provider partnership for better health care. *Online Journal of Public Health Informatics*, *6*(2).

[2] Archer, N., Fevrier-Thomas, U., Lokker, C., McKibbon, K. A., & Straus, S. E. (2011). Personal health records: A scoping review. *Journal of the American Medical Informatics Association*, *18*(4), 515–522.

[3] Ball, M. J., Carla Smith, N., & Bakalar, R. S. (2007). Personal health records: Empowering consumers. *J Healthc Inf Manag*, *21*(1), 77.

[4] Ball, M. J., & Gold, J. (2006). Banking on health: Personal records and information exchange. *Journal of Healthcare Information Management*, *20*(2), 71.

[5] Brailovskaia, J., Margraf, J., & Schneider, S. (2022). Social Media as Source of Information, Stress Symptoms, and Burden Caused by Coronavirus (COVID-19). *European Psychologist*.

[6] Chang, B. L., Bakken, S., Brown, S. S., Houston, T. K., Kreps, G. L., Kukafka, R., Safran, C., & Stavri, P. Z. (2004). Bridging the digital divide: reaching vulnerable populations. *Journal of the American Medical Informatics Association*, *11*(6), 448–457.

[7] Cushman, R., Froomkin, A. M., Cava, A., Abril, P., & Goodman, K. W. (2010). Ethical, legal, and social issues for personal health records and applications. *Journal of Biomedical Informatics*, *43*(5), S51–S55.

[8] Czaja, S. J., Zarcadoolas, C., Vaughon, W. L., Lee, C. C., Rockoff, M. L., & Levy, J. (2015). The usability of electronic personal health record systems for an underserved adult population. *Human Factors*, *57*(3), 491–506.

[9] Detmer, D., Bloomrosen, M., Raymond, B., & Tang, P. (2008). Integrated personal health records: Transformative tools for consumer-centric care. *BMC Medical Informatics and Decision Making*, *8*(1), 1–14.

[10] Druss, B. G., Ji, X., Glick, G., & von Esenwein, S. A. (2014). Randomized trial of an electronic personal health record for patients with serious mental illnesses. *American Journal of Psychiatry*, *171*(3), 360–368.

[11] Fisher, B., Bhavnani, V., & Winfield, M. (2009). How patients use access to their full health records: A qualitative study of patients in general practice. *Journal of the Royal Society of Medicine*, *102*(12), 539–544.

[12] Gandhi, T. K., Weingart, S. N., Borus, J., Seger, A. C., Peterson, J., Burdick, E., Seger, D. L., Shu, K., Federico, F., & Leape, L. L. (2003). Adverse drug events in ambulatory care. *New England Journal of Medicine*, *348*(16), 1556–1564.

[13] Genitsaridi, I., Kondylakis, H., Koumakis, L., Marias, K., & Tsiknakis, M. (2015). Evaluation of personal health record systems through the lenses of EC research projects. *Computers in Biology and Medicine*, *59*, 175–185.

[14] Green, B. B., Cook, A. J., Ralston, J. D., Fishman, P. A., Catz, S. L., Carlson, J., Carrell, D., Tyll, L., Larson, E. B., & Thompson, R. S. (2008). Effectiveness of home blood pressure monitoring, Web communication, and pharmacist care on hypertension control: A randomized controlled trial. *Jama*, *299*(24), 2857–2867.

[15] Gregory-Head, B. (1999). Patients and the Internet: Guidance for evidence-based choices. *The Journal of the American College of Dentists*, *66*(2), 46–50.

[16] Halamka, J. D., Mandl, K. D., & Tang, P. C. (2008). Early experiences with personal health records. *Journal of the American Medical Informatics Association*, *15*(1), 1–7.

[17] HI, A.-S. A. Ms. (2016). Perceived challenges for adopting the personal health record (PHR) at the Ministry of National Guard Health Affairs (MNGHA)-Riyadh. *Online Journal of Public Health Informatics*, *8*(3).

[18] Hilfiker, S. W., Santana, S., Freedman, M., & Harris, L. M. (2019). There'sa a gap between digital health information and users—Let's close it. *Information Services & Use*, *39*(1–2), 15–22.

[19] Kaelber, D. C., Jha, A. K., Johnston, D., Middleton, B., & Bates, D. W. (2008). A research agenda for personal health records (PHRs). *Journal of the American Medical Informatics Association*, *15*(6), 729–736.

[20] Kahn, J. S., Hilton, J. F., Van Nunnery, T., Leasure, S., Bryant, K. M., Hare, C. B., & Thom, D. H. (2010). Personal health records in a public hospital: Experience at the HIV/AIDS clinic at San Francisco General Hospital. *Journal of the American Medical Informatics Association*, *17*(2), 224–228.

[21] Kannry, J., Beuria, P., Wang, E., & Nissim, J. (2012). Personal health records: Meaningful use, but for whom? *Mount Sinai Journal of Medicine: A Journal of Translational and Personalized Medicine*, *79*(5), 593–602.

[22] Kim, E.-H., Stolyar, A., Lober, W., Herbaugh, A., Shinstrom, S., Zierler, B., Soh, C., & Kim, Y. (2009). Challenges to using an electronic personal health record by a low-income elderly population. *Journal of Medical Internet Research*, *11*(4), e1256.

[23] McInnes, D. K., Solomon, J. L., Bokhour, B. G., Asch, S. M., Ross, D., Nazi, K. M., & Gifford, A. L. (2011). Use of electronic personal health record systems to encourage HIV screening: An exploratory study of patient and provider perspectives. *BMC Research Notes*, *4*(1), 1–11.

[24] Noblin, A. M., Wan, T. T., & Fottler, M. (2012). The impact of health literacy on a patient's decision to adopt a personal health record. *Perspectives in Health Information Management/AHIMA, American Health Information Management Association*, *9*(Fall).

[25] Pagliari, C., Detmer, D., & Singleton, P. (2007). Potential of electronic personal health records. *Bmj*, *335*(7615), 330–333.

[26] Patel, V. N., Dhopeshwarkar, R. V., Edwards, A., Barrón, Y., Sparenborg, J., & Kaushal, R. (2012). Consumer support for health information exchange and personal health records: A regional health information organization survey. *Journal of Medical Systems*, *36*(3), 1043–1052.

[27] Saquib, J. (2020). Internet addiction among Saudi Arabian youth. *International Journal of Health Sciences*, *14*(2), 1.

[28] Sarwal, D., & Gupta, V. (2021). Personal Health Record. In *StatPearls [Internet]*. StatPearls Publishing.

[29] Señor, I. C., Alemán, J. L. F., & Toval, A. (2012). Personal health records: New means to safely handle health data? *Computer*, *45*(11), 27–33.

[30] Sharanesha, R. B., Aljuai, B. K., Alfaifi, T. A., Shukr, A. M., Bamuqadm, M. A., & Alhoti, A. A. (2021). Knowledge and attitude regarding COVID-19 among students from multiple professional backgrounds in Riyadh Region, Saudi Arabia: A cross-sectional study. *Journal of Pharmacy & Bioallied Sciences*, *13*(Suppl 1), S251.

[31] Tenforde, M., Nowacki, A., Jain, A., & Hickner, J. (2012). The association between personal health record use and diabetes quality measures. *Journal of General Internal Medicine*, *27*(4), 420–424.

[32] Vance, B., Tomblin, B., Studney, J., & Coustasse, A. (2015). *Benefits and barriers to adoption of personal health records*.

[33] Versel, N. (2011). Personal health records: Docs have 3 big doubts. *Information Week*.

[34] Walker, J., Pan, E., Johnston, D., Adler-Milstein, J., Bates, D. W., & Middleton, B. (2005). The Value of Health Care Information Exchange and Interoperability: There is a business case to be made for spending money on a fully standardized nationwide system. *Health Affairs*, *24*(Suppl1), W5-10.

[35] Wynia, M., & Dunn, K. (2010). Dreams and nightmares: Practical and ethical issues for patients and physicians using personal health records. *The Journal of Law, Medicine & Ethics*, *38*(1), 64–73.

[36] Wynia, M. K., Torres, G. W., & Lemieux, J. (2011). Many physicians are willing to use patients' electronic personal health records, but doctors differ by location, gender, and practice. *Health Affairs*, *30*(2), 266–273.

[37] Yau, G. L., Williams, A. S., & Brown, J. B. (2011). Family physicians' perspectives on personal health records: Qualitative study. *Canadian Family Physician*, *57*(5), e178–e184.

[38] ZIEGER, A. C. (2010). Personal Health Record Use is on the Upswing. *Clinical Psychiatry News*, *38*(5), 8–8.