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Did Smart Phones Support Jordanian Senior Citizens to Achieve Digital Empowerment: Evidence From Reality

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Abstract

Current study hypothesized that 'Smartphones features (Internet Connectivity, Mobile Applications, Touchscreen Interface, Voice Assistants, Biometric Security and Mobile Payments) have the ability to increase digital empowerment among Jordanian senior citizens'. Quantitative methodology was adopted through using a questionnaire. (467) senior individuals responded to an online questionnaire and SPSS was used to screen and analyze collected primary data. Results of analysis indicated the acceptance of the hypothesis arguing that smartphones increased seniors' digital empowerment. Smartphones allow senior citizens to retrieve unlimited information while accessing services and entertainment so they can learn throughout life and improve their personal growth. the study demonstrated that policymakers together with technology developers in Jordan should design mobile applications which present user-friendly features including voice assistants and biometric security protocols to match the needs of senior citizens. Study recommended developing user interface and mobile app features for smartphones which address the particular requirements of senior citizens throughout Jordan. Further recommendations appeared in the study.

Keywords: Smartphone, Digital Empowerment, Internet Connectivity, Mobile Applications, Touchscreen Interface

1. Introduction

The introduction of smartphones created major life changes that transformed human communication and work capabilities and information retrieval methods. The biggest change

brought by smartphones results from their ability to create improved connectivity. Through their instant connectivity, features for telephone calls and instant messages and email and social media access smartphones enable users to maintain contact with friends, family, and colleagues across any distance. Smartphone connectivity has completely altered social relationships and established a unified presence that allows fast and easily accessible human communication.

McHaney (2023) stated that smartphones have revolutionized how users obtain information together with entertainment materials. Mobile phone users can access unlimited online knowledge through the internet which enables them to perform instant searches for information and watch videos and listen to music and read news and participate in digital content. Andersson (2022) agreed on the same idea adding that the simple availability of broad resources through smartphones has transformed how people learn and entertain themselves and obtain information which makes these devices essential for daily life activities between work and leisure.

2. Literature Review

2.1 The Emergence of Smartphones

According to Isiaka et al. (2024), smartphones have started a revolutionary change in technological history which transforms user interactions with digital information and digital world participation. Smartphones originated during the early 2000s before developing into multiservice devices that integrate high-speed internet plus advanced cameras and mobile applications and digital payment features. Traditional cell phones that gained computing powers have developed into universal devices which users worldwide utilize for instant connection and informational access alongside entertainment functions (George et al., 2023). Kakolu and Faheem (2023) noted that the rapid growth of smartphone technology transformed personal communication functions while creating substantial effects throughout business operations alongside educational and healthcare systems and social relationships. These devices made possible the digital transformation of services and transactions thus allowing businesses to expand their reach by using mobile applications and online digital platforms. From perspective of Abduljawad and Ahmad (2023), the education sector benefits from smartphones because they provide remote learning opportunities through e-learning and educational resources and collaborative tools. Smartphones enable the delivery of better healthcare because they support telemedicine solutions along with health monitoring software and remote medical observation that expands healthcare accessibility and promotes health optimization.

2.2 Technology and Senior Citizens

Abouzahra and Ghasemaghaei (2022) argued that the widespread adoption of smartphones has acted as a vital tool to eliminate digital disparities among senior citizens thus giving them the ability to participate more actively with technology. Smartphones enable senior adults to connect better through accessible features and simple interfaces and dedicated applications that result in improved quality of life. Senior citizens now maintain social connections with loved ones through smartphone platforms featuring calls and video chats and social media platforms which help prevent older adults from experiencing common social isolation in advanced age (Urbina et al., 2022).

Sorwar et al. (2023) agreed on the fact that smartphones enable senior citizens to access diverse information and services as well as entertainment which both improves their daily quality of life and enables continuous learning experiences. Mobile application tools provide senior

citizens with health monitoring capabilities and medication alerts together with intellectual stimulus workouts while offering virtual entertainment options to help them track their health and keep their minds alert to engage with technology (Tirado-Morueta et al., 2023). The mobile nature of smartphones now provides older adults with easy access to crucial services thus allowing them to maintain their independence when performing daily tasks (Perdana and Mokhtar, 2022).

2.3 Digital Empowerment

The concept of digital empowerment is basically without a single creator of its origin in the history of human thought. Various experts in technology sociology and development studies have developed the concept of digital empowerment through their academic research and practice (Sharma et al., 2022). Digital empowerment involves using digital technology to help people and communities obtain access to information together with resources and opportunities for better social capability and autonomy and active participation (Xiao et al., 2022). The term gained popularity through academic publications as well as policy documents and initiatives which focus on using technology to give marginalized groups digital capabilities for bridging divides and fostering social inclusion (Gonzalez-Mohino et al., 2023).

On the concept of digital empowerment, Bill Gates defined it as the technical process that gives people access to knowledge and resources to enhance their personal growth while joining the digital marketplace (Setiadi et al., 2023). The Chief Operating Officer at Facebook 'Sheryl Sandberg' defined digital empowerment as both an opportunity to boost voices through technology and a means for promoting equality along with enabling meaningful user interactions and sharing of stories online (Kumar and Shobana, 2023).

As for the creator of the World Wide Web 'Tim Berners-Lee', he viewed digital empowerment as a way to use internet and digital technology power for inclusivity and accessibility alongside collaboration which allows people to share and access worldwide information (Radanliev et al., 2024). Digital empowerment describes the method of utilizing digital tools through digital platforms to establish meaningful connections and self-expression and acquire control in the digital world according to psychologist 'Sherry Turkle' (Romeo, 2024).

2.4 Digital Empowerment for Senior Citizens

Zhang et al (2023) argued that digital empowerment movement has brought significant change to senior citizens by teaching them how to competently use technology while boosting their digital inclusion and technological engagement. Older people gain fundamental digital competencies such as online communication along with information retrieval and digital literacy through accessible equipment and specialized training along with supportive online groups. The digital empowerment of seniors allows them to video call their loved ones and access social media along with numerous online resources which improve their social participation and mental stimulation and total well-being (Liang et al., 2022; Hashem,2016).

Leclercq and Rijshouwer (2022) argued that senior citizens now have digital tools that enable them to take part in the digital economy and use virtual healthcare services while also pursuing lifelong learning activities to improve their independence. Technology tools enable older adults to monitor their health and access telemedicine services and medication tracking systems that result in better health outcomes together with increased self-dependence. Senior citizens can enhance their life quality during retirement through digital resources that allow them to pursue intellectual interests and educational development in addition to continuing their creative pursuits through online museums and libraries (Sen et al., 2022).

2.5 Aspects of Smartphones that Granted Empowerment for Senior Citizens

2.5.1 Internet Connectivity

As was argued by Zhang (2022), through Internet connectivity senior citizens obtain digital empowerment by reaching unlimited information together with online resources and communication systems. The internet lets seniors maintain easy contact with loved ones through video chats and messaging platforms and social networks. Health resources along with news entertainment and educational content and access to services enable senior citizens to achieve better knowledge and improved social connections as well as better personal well-being.

2.5.2 Mobile Applications

Tajudeen et al. (2022) noted that mobile applications designed for senior users have greatly boosted their ability to use digital channels. Software applications dedicated to senior citizens include features which assist with medication tracking and brain exercises alongside fitness statistics and social platforms meant for their particular needs. Mobile applications help seniors with daily operations while stimulating their mental capacities and connecting them with others which leads to better independence and quality of life.

2.5.3 Touchscreen Interface

Dolah and Wenhao (2023) saw that the touchscreen interface on smartphones has established technology as a user-friendly accessible system for older citizens. Senior citizens find touchscreens highly intuitive because they can easily operate their devices to access applications while browsing the internet and communicating with others. The easy-to-use interface improves both senior citizens' understanding of digital tools and their comfort when using smartphones to perform different tasks.

2.5.4 Voice Assistants

According to Liu et al. (2023), modern smartphones allow seniors to use voice assistants including Siri, Google Assistant and Alexa for easier smartphone interaction. These assistants operate the device hands-free by enabling voice commands to perform tasks thus making smartphones more useable for people who have limited dexterity or visual impairments. Voice assistants help seniors achieve better efficiency while increasing their ability to harness technology benefits throughout their everyday activities.

2.5.5 Biometric Security

Wang et al. (2024) stated that fingerprint sensors along with facial recognition technologies on smartphones grant senior citizens improved privacy protection while maintaining their data safe. The built-in security features safeguard digital data from unauthorized entry while maintaining confidentiality which makes users feel confident about their digital service usage. Biometric security systems enable seniors to perform online activities safely while making transactions online.

2.5.6 Mobile Payments

Sanders (2022) stated that mobile payment features integrated into smartphones now allow senior citizens to use digital methods for managing their finances and handling transactions. Mobile payments through smartphones provide older adults with secure transactions and easy bill payment in addition to cash-free online shopping. Mobile payments on smartphones provide elderly individuals improved control of their finances while offering increased independence for seamless e-commerce activities.

Generally speaking, further research based on existing literature has highlighted the fact that smart phone characteristics are vital in the digital empowerment of the elderly population in terms of the culture and region of residence. Zhang et al. (2023) specifically investigated the adoption and engagement of older smartphone owners and how particular functions of a smartphone contribute to numerous aspects of dependence, confirming that anything that helps make interaction easier contributes to the feeling of confidence in smartphone and internet use. These results echo a prior study by Sorwar et al. (2023), which emphasized that user-friendly and customizable designs-such as health monitoring apps and voice controls are critical in prompting long-term adoption of technology by elderly users. This kind of research indicates that smartphone features must be matched to the highly particular requirements of older adults in order to make digital tools a useful process of empowerment.

Recent research has entered the realm of psychology and social aspects of digital empowerment that is enabled by smartphones. A study by Urbina et al. (2022) established that social connectivity using smartphones leads to a significant decrease in loneliness and Social Isolation thereby increasing the Mental health of seniors. In the same manner, Tirado-Morueta et al. (2023) noted that the access to platforms of online social interactions and the use of telehealth services not only have practical functions but also stimulate the feeling of autonomy and belonging among seniors. The insights can be considered part of the previous literature, but their novelty is that digital empowerment does not just imply access to information, but it touches emotional and social well-being, which, in turn, is essential to holistic aging.

Moreover, many of the technological improvements like biometric security, and mobile payments have received attention in boosting the confidence and the sense of independence of the seniors in using digital environments. Wang et al. (2024) explored the biometric verification processes such as fingerprint identification and facial recognition that provide an ideal solution to basic security issues and enable people to have comfortable access to online services. To supplement this, Sanders (2022) discussed the concept of mobile payment systems, which show how convenient financial applications provide the ability to acquire autonomy in financial management enabling young people to manage their funds adequately and safely. All these studies confirm the idea that security and financial applications incorporated in smartphones play a critical role in eliminating impediments to digital inclusion among seniors.

Last but not least, recent studies indicate that user-centered design and specialized training is critical when it comes to making the capabilities of smartphones gain the most when used by older citizens. According to Leclercq and Rijshouwer (2022), having the seniors involved in the co-creation of the digital platforms allows them to be intuitive and accessible to use, and as a result, more of them get adopted. On the same note, access to technological support services and educational programs are also essential in overcoming the existing digital literacy gaps, as indicated by Tirado-Morueta et al. (2023). Such observations remind us that the possibilities of smartphones to empower elderly people in various socio-economic environments cannot be exhausted with technological properties alone, although being user-friendly and feature-wise, the devices definitely constitute an important factor in empowering the aging population.

3. Questions, Model and Hypotheses

Looking at the main problem we have presented here, developing a model was necessary in order to locate the relationship between variables. The main question of study was:

HOW DID SMARTPHONES GRANT DIGITAL EMPOWERMENT FOR SENIOR CITIZENS IN JORDAN?

As for study model and hypotheses, we have developed the following:

Main Hypothesis:

H: Smartphones were able to grant digital empowerment for senior citizens in Jordan

Sub-Hypotheses:

- **H1:** Internet connectivity in smartphones was able to grant digital empowerment for senior citizens in Jordan
- **H2:** Mobile applications in smartphones was able to grant digital empowerment for senior citizens in Jordan
- **H3:** Touchscreen interface in smartphones was able to grant digital empowerment for senior citizens in Jordan
- **H4:** Voice assistance in smartphones was able to grant digital empowerment for senior citizens in Jordan
- **H5:** Biometric security in smartphones was able to grant digital empowerment for senior citizens in Jordan
- **H6:** Mobile payments in smartphones were able to grant digital empowerment for senior citizens in Jordan

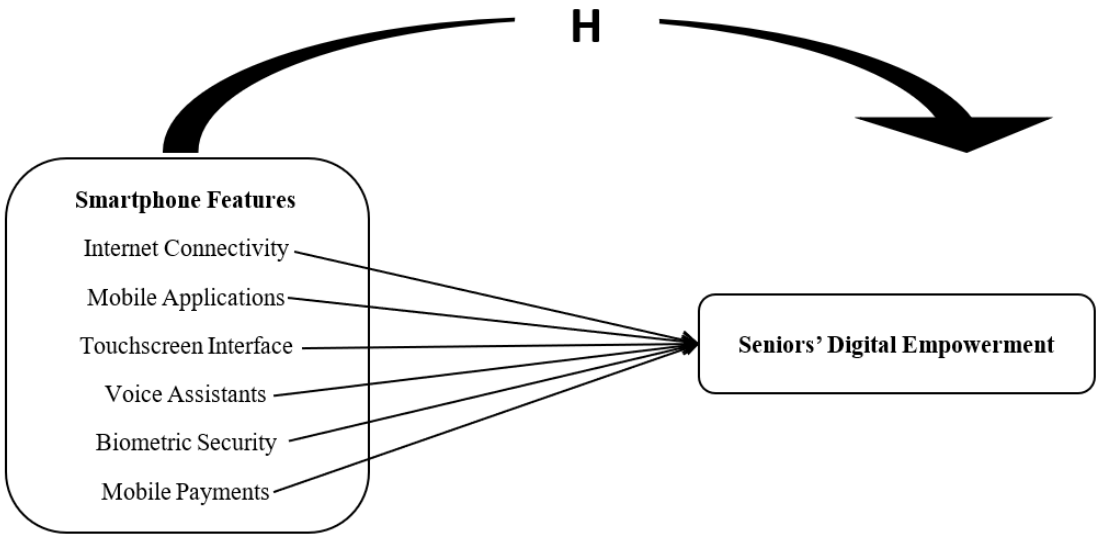

Figure 1. Study Model

4. Methods and Materials

4.1 Methodological Approach

Quantitative methodology was chosen to be the main approach in current study. We have noticed that quantitative methodology is best suited in order to collect primary data from a larger sample size, in addition to increasing our ability to generalize results.

4.2 Tool of Study

A questionnaire was utilized as the main tool of current study. We have built the questionnaire through the aid of previous studies including Zhang et al (2023); Leclercq and Rijshouwer (2022); Sen et al., 2022); Tajudeen et al. (2022); Dolah and Wenhao (2023); Liang et al., (2022); Liu et al. (2023); Wang et al. (2024) and Sanders (2022). The questionnaire consisted of (56) items after arbitration and consisted of two main sections. The first section took into perspective demographics of study sample. While the other section presented statements related to study's variables.

4.3 Population and Sampling

Population of study consisted of senior citizens in Jordan who had access to internet and were able to deal with online questionnaires. A simple random sample of (500) individuals responded to the online questionnaire which was uploaded online trough Google Forms. After application process, we were able to retrieve (467) properly filled questionnaire indicating a response rate of (93.4%) as statistically accepted ratio.

4.4 Data Screening and Processing

Dealing with collected primary data and analyzing it was done depending on statistical package for social sciences (SPSS). Cronbach's Alpha (α) was used in order to check the reliability and consistency of study tool. As Table 1 indicated, it was seen that all variables scored an α that was higher than 0.70. This meant that the questionnaire was reliable and consistent. Other statistical tests were run including multiple and linear regression.

Table 1. Alpha Value

variable	Alpha value
Internet Connectivity	0.815
Mobile Applications	0.824
Touchscreen Interface	0.904
Voice Assistants	0.885
Biometric Security	0.898
Mobile Payments	0.949
Digital Empowerment	0.854

Source: (SPSS)

5. Results and Discussion

5.1 Demographics Results

Demographic data of respondents were calculated depending on frequency and percentage. Table 2 indicated that majority of respondents were males forming 65.3% with BA degree forming 41.8%. In addition, most of respondents were either retired 48.6% or owning their own business 42.8%. Most of seniors who responded to the questionnaire indicated that they had an income of less than $1000 forming 53.1%.

Regarding yes/no questions, when individuals were if their smartphone accompany them all the time, surprisingly 98.5% of them answered 'yes'. When they were asked if there are specific activities they prefer to do on their smartphones, 86.9 of them came with a 'yes'. As for the final question, we asked respondents if they feel that the smartphone is a benefit to their life, 97.4% of them answered yes smartphones are a benefit to their lives.

Table 2. Demographics

		f	%
Gender			
	Female	162	34.7
	Male	305	65.3
Education			
	BA	195	41.8
	Diploma or Less	122	26.1
	PhD	128	27.4
	MA	22	4.7
Occupation			
	Own Business	200	42.84
	Retired	227	48.61
	Housewife	40	8.57
Income			
	$1001-$1999	127	27.2
	Less than $1000	248	53.1
	More than $2000	92	19.7
Does Your Smartphone Accompany You All The Time?			
	Yes	460	98.50
	No	7	1.50
Do you have specific activities that you prefer to do with your smartphone?			
	Yes	402	86.90
	No	65	13.9
Do you feel that the smartphone has been a benefit to your life?			
	Yes	455	97.4
	No	12	2.5
Total		**467**	**100.0**

Source: (SPSS)

5.2 Questionnaire Analysis

Mean (μ) and standard deviation (σ) were used in order to analyze data of questionnaire items. It was noticed that all statements scored a mean that was higher than mean of scale 3.00 indicating that all statement were positively received by respondents.

Table 3. Questionnaire Analysis

Statement	μ	σ
I am always connected to the Internet and do not need TV or radio	4.032	.998
I follow all my programs through the phone	3.859	.636
I check the news and weather through the phone and this is easy for me	4.141	.349
I feel that my daily newspaper is in my pocket	4.529	.500
When I cannot make a call I can send a message and this is easy	4.435	.496
Dealing with the Internet is not as difficult as I imagined	4.439	.497
I can reach any place as long as my phone is connected to the Internet	4.486	.500
I spend a lot of my boredom time browsing the Internet and reading news and entertaining articles	4.435	.496
Internet Connectivity	**4.294**	**.296**
There are applications that help enlarge the font and facilitate vision.	4.807	.395
I have applications that measure blood pressure and heart rate.	3.540	1.849
I find that there are many health applications that help educate and raise awareness	4.435	.496
I follow applications that help me make nutritional decisions according to my condition.	3.799	.812
I feel that I am more cultured and knowledgeable because of the scientific applications that exist.	4.325	.561
There are medical applications that remind me of medication times and doctors' appointments all the time.	4.032	.899

Statement	μ	σ
I feel that I am more able to deal with technological development because of these applications.	3.024	1.504
Mobile Applications	**3.994**	**.375**
There is a problem in my opinion and the idea of the touch screen is easier for me	3.278	.775
I do not find it difficult to choose letters and numbers because of the touch screen	3.891	.638
I do not spend a lot of time searching for the letters, words and numbers that I want	3.017	1.502
I find that the smartphone is one of the best inventions of humanity	3.488	1.829
With my health condition and the difficulty of holding my hand steady, the touch screen helped me a lot	3.488	1.829
I interact with the phone screen easily and quickly	4.362	.699
I move between applications faster than a regular phone	3.906	1.034
I control the touch settings according to my desire and ability	3.660	.731
Touchscreen Interface	**3.636**	**.949**
Because of my hearing loss, the voice assistant on my phone is very useful.	3.081	1.811
I am always in touch with my family because of the voice assistant on my phone.	3.317	1.745
I enjoy the news and articles when the voice assistant on my phone reads them to me.	3.317	1.824
I am always up to date with the latest news and events because I hear the news all the time.	4.666	.563
My phone reads me messages all the time.	3.302	1.071
The phone helps me determine prayer times by making the call to prayer, which is good for me.	3.953	.484
I do not forget an important matter or a specific appointment because the phone reminds me of it all the time.	3.490	1.089
Voice Assistants	**3.589**	**1.030**
The idea of memorizing passwords is annoying to me	4.034	.886
My phone stores my numbers and passwords and reminds me of them	3.281	1.089
I don't need a password because I use my voice to interact with the phone	3.758	1.425
I don't need a password because I use my fingerprint to interact with the phone	3.246	1.798
I don't need a password because I use my face to interact with the phone	3.591	.695
No one can use my phone as long as it is not in my hand	4.069	.409
You can know the places I frequent through the location and geographical data	3.745	.656
I can know my government status, my bank accounts and more through my fingerprint or face	2.991	1.034
My private matters are confidential and no one can access them without my permission through the phone	3.745	.656
Biometric Security	**3.607**	**.775**
I manage my finances without having to move from one place to another	3.319	1.105
I pay bills in an organized manner through my phone	3.961	.631
I manage my bank accounts through my bank applications	3.319	1.105
I communicate with the banks I deal with through the phone or chat, which is convenient for me	3.366	1.069
I make bank transfers easily and conveniently, and I do not need to go to the bank branches	3.593	.713
Always aware of my savings and accounts without the need for papers or bank statements.	3.687	.622
I know my spending level through my mobile phone and banking applications.	3.734	.679
Mobile Payments	**3.569**	**.764**
I use advanced technology easily and smoothly on a daily basis.	3.816	.659
I do not need help from anyone, as I know how to deal with the smartphone I have.	4.047	.573
I benefit greatly from the smartphone and the applications on it.	4.141	.349
I know how to interact with all applications, regardless of their purpose.	4.000	.307
I have the ability to accept different technological changes.	3.580	.846
I have the ability to change smoothly without resistance	4.094	.292
I resort to the voice assistant all the time in case I cannot read	3.595	1.398
I know how to use the smartphone in case of emergency or help	3.769	.606
The smartphone keeps me informed about world events and this is something I like	4.094	.292
I see the smartphone as very important for the elderly and their safety	3.458	1.754
Digital Empowerment	**3.860**	**.560**

Source: (SPSS)

5.3 Hypotheses Testing

In current study, it was hypothesized that 'Smartphones features have the ability to increase digital empowerment among Jordanian senior citizens'. Testing this hypothesis was done using multiple regression and it was found out a significant positive correlation (r = 0.969) between the independent variables and the dependent variables. With regard to the overall variation in the dependent variable, the independent variables are responsible for an extra 93.9% of the variance. Taking into consideration the fact that the F value was statistically significant at the 0.05 level; it can be inferred that 'Smartphones features have the ability to increase digital empowerment among Jordanian senior citizens.

Table 4. Testing Main Hypothesis

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients				
		B	Std. Error	Beta	t	Sig.	R	R Square
1	(Constant)	-.883	.121		-7.294	.000	.969	.939
	Internet Connectivity	.391	.031	.207	12.790	.000		
	Mobile Applications	.233	.021	.156	10.992	.000		
	Touchscreen Interface	.104	.014	.176	7.532	.000		
	Voice Assistants	.044	.014	.080	3.050	.002		
	Biometric Security	.229	.021	.317	10.802	.000		
	Mobile Payments	.218	.016	.297	13.287	.000		

Source: (SPSS)

As for sub-hypotheses, we have used linear regression and the following results were reached and summarized in the previous Table 4.

- **H1:** Internet connectivity has the ability to increase digital empowerment among Jordanian senior citizens, since t- value is significant at 0.05 level
- **H2:** Mobile applications have the ability to increase digital empowerment among Jordanian senior citizens, since t- value is significant at 0.05 level
- **H3:** Touch screen interface has the ability to increase digital empowerment among Jordanian senior citizens, since t- value is significant at 0.05 level
- **H4:** Voice assistance has the ability to increase digital empowerment among Jordanian senior citizens, since t- value is significant at 0.05 level
- **H5:** Biometric security has the ability to increase digital empowerment among Jordanian senior citizens, since t- value is significant at 0.05 level
- **H6:** Mobile payment has the ability to increase digital empowerment among Jordanian senior citizens, since t- value is significant at 0.05 level

5.4 Discussion

Current study was built on the premises that 'Smartphones features have the ability to increase digital empowerment among Jordanian senior citizens'. We have adopted some features that are mostly recognizable in smartphones which included (Internet Connectivity, Mobile Applications, Touchscreen Interface, Voice Assistants, Biometric Security and Mobile

Payments). Dealing with such premises required depending on quantitative methodology through using a questionnaire. (467) responded to an online questionnaire and SPSS was used to screen and analyze collected primary data. Results of analysis indicated that through smartphones, senior citizens gain digital empowerment by obtaining access to numerous resources and opportunities.

Among the chosen sub-variables of study, it was noted the internet connectivity gained the highest influence with B= .391. This meant that senior citizens use smartphones to obtain extensive internet-based information which includes news content and health resources and educational materials and many other types of information. This agreed with Zhang (2022) who argued that the ability to access information through mobile devices provides seniors with personal empowerment by connecting them to the current events and social world.

In the second rank there appeared that mobile applications scored a B= .233. This indicated that health monitoring apps provide senior citizens with the ability to track fitness levels along with monitoring health conditions while managing medications. Mobile applications provide tools which enable seniors to manage their health needs independently.

On the third rank came biometric security with B= .229. The implementation of biometric security measures including fingerprint scanners or facial recognition creates secure access to smartphones which protects senior citizens' personal information and their data. Wang et al. (2024) agreed on the same idea adding that the security feature enables senior citizens to operate their devices with complete confidence because they can use their devices securely.

Mobile payments came in the fourth rank with B= .218. Mobile payment services provided by Apple Pay and Google Pay enable older adults to perform secure transactions through their smartphones thus replacing traditional payment systems. Sanders (2022) added that the feature enables seniors to accomplish online shopping and financial bill payments and money management without difficulty.

Generally speaking, through smartphones seniors can use the internet to discover news articles and healthcare information as well as educational materials and online classes which enable them to expand their knowledge base. A wide range of smartphone applications exists to support seniors through features that manage medications and track fitness progress while stimulating their minds and provide accessibility options for comfortable use.

6. Conclusion and Recommendations

Study was able to prove that senior citizens gain digital empowerment through smartphones that enable better connection to both family members and the overall community. The built-in video calling and messaging app and social media features enable seniors to maintain real-time connections with their loved ones thus fighting social isolation and loneliness. The growing network capabilities enable senior citizens to develop deeper relationships that provide opportunities for meaningful conversation and experience exchange through virtual social spheres which strengthen their social welfare.

Based on that, study recommended:

- Develop user interface and mobile app features for smartphones which address the particular requirements of senior citizens throughout Jordan.
- Jordan should implement training courses together with support resources to help older citizens learn smartphone functions that build digital capabilities.

- Organize support for government policies that improve digital accessibility for senior citizens across Jordan.
- Affordable accessible smartphones featuring empowering technology should reach all older adults from different economic levels to eliminate digital disparities.

6.1 Practical and Theoretical Implications

Current study was launched based on both practical and theoretical implications. From a practical perspective, the study demonstrated that policymakers together with technology developers in Jordan should design mobile applications which present user-friendly features including voice assistants and biometric security protocols to match the needs of senior citizens.

From a theoretical perspective, this research expands knowledge about digital empowerment practices among Jordanian senior citizens. This research shows how smartphone features drive digital empowerment but urges more investigation about technological empowerment methods for different cultural elderly populations.

6.2 Limitations of Study

The research limitations include possible difficulties with extending the study results to other contexts outside of Jordan. Smartphone features affect digital empowerment of senior citizens differently across nations and regions because of distinct cultural elements and technological systems as well as economic circumstances. A study methodological limitation arises from self-reported data collection methods and small participant numbers because these approaches introduce possible biases that affect study results. Research improvement will come from combining larger study groups with qualitative and quantitative research approaches to achieve stronger results.

6.3 Future Research

Author suggested investigating long-term smartphone effects on digital empowerment among Jordanian senior citizens would benefit from using longitudinal study methods. Such study would reveal the enduring effects technology has on empowerment development and welfare maintenance for older adults. There would also be a space for comparing smartphone feature effects on digital empowerment across multiple nations and regions would reveal how these practices influence senior citizens. Knowledge of these distinctions between countries should guide the creation of specific support services for older people worldwide.

References

Abduljawad, M., & Ahmad, A. (2023). An analysis of mobile learning (M-Learning) in education. Multicultural Education, 9(2), 2023.

Abouzahra, M., & Ghasemaghaei, M. (2022). Effective use of information technologies by seniors: the case of wearable device use. European Journal of Information Systems, 31(2), 241-255. https://doi.org/10.1080/0960085X.2021.1876534

Andersson, C. (2022). Smartphones and online search: shifting frames in the everyday life of young people. Information and learning sciences, 123(7/8), 351-370. https://doi.org/10.1108/ILS-03-2022-0025

Dolah, J., & Wenhao, C. (2023). Interface Design Of Mobile Chat App Based On The Usage Habits Of The Elderly. International Journal of Creative Future and Heritage (TENIAT), 11(2), 20-49.

George, A. S., George, A. H., & Baskar, T. (2023). The Death of Analog: Assessing the Impacts of Ubiquitous Mobile Technology. Partners Universal Innovative Research Publication, 1(2), 15-33.

Gonzalez-Mohino, M., Rodriguez-Domenech, M. Á., Callejas-Albiñana, A. I., & Castillo-Canalejo, A. (2023). Empowering critical thinking: The role of digital tools in citizen participation. Journal of New Approaches in Educational Research, 12(2), 258-275. https://doi.org/10.7821/naer.2023.7.1385

Hashem, T. (2016). The impact of social media on customers' image for mobiles. Journal of Advances in Humanities and Social Sciences, 2(5), 269-277. https://doi.org/10.20474/jahss-2.5.3

Isiaka, A. O., Soliu, A., Aremu, B. A., Bamidele, B. A., Saba-Jibril, S., & Ibitoye, A. R. (2024). The Evolving Role Of Libraries In The Fourth Industrial Revolution: Navigating Digital Transformation. Library Philosophy & Practice.

Kakolu, S., & Faheem, M. A. (2023). Digitization and automation in mobile applications: A catalyst for operational efficiency and user engagement.

Kumar, J. S., & Shobana, D. (2023). A Study on Role of Women in Shaping Digital Marketing: Empowerment and Innovation.

Leclercq, E. M., & Rijshouwer, E. A. (2022). Enabling citizens' Right to the Smart City through the co-creation of digital platforms. Urban Transformations, 4(1), 2. https://doi.org/10.1186/s42854-022-00030-y

Liang, X., Xiong, F., & Xie, F. (2022). The effect of smartphones on the self-rated health levels of the elderly. BMC Public Health, 22(1), 508. https://doi.org/10.1186/s12889-022-12952-0

Liu, M., Wang, C., & Hu, J. (2023). Older adults' intention to use voice assistants: usability and emotional needs. Heliyon, 9(11). https://doi.org/10.1016/j.heliyon.2023.e21932

McHaney, R. (2023). The new digital shoreline: How Web 2.0 and millennials are revolutionizing higher education. Taylor & Francis. https://doi.org/10.4324/9781003447979

Perdana, A., & Mokhtar, I. A. (2022). Seniors' adoption of digital devices and virtual event platforms in Singapore during Covid-19. Technology in Society, 68, 101817. https://doi.org/10.1016/j.techsoc.2021.101817

Radanliev, P., De Roure, D., Novitzky, P., & Sluganovic, I. (2024). Accessibility and inclusiveness of new information and communication technologies for disabled users and content creators in the Metaverse. Disability and Rehabilitation: Assistive Technology, 19(5), 1849-1863. https://doi.org/10.1080/17483107.2023.2241882

Romeo, A. (2024). New Forms of Interaction in the Digital Age: The Use of the Telephone. Social Sciences, 13(3), 153. https://doi.org/10.3390/socsci13030153

Sanders, D. D. (2022). Senior citizens and mobile banking: A quantitative multiple regression study. Northcentral University.

Sen, K., Prybutok, G., & Prybutok, V. (2022). The use of digital technology for social wellbeing reduces social isolation in older adults: A systematic review. SSM-population health, 17, 101020. https://doi.org/10.1016/j.ssmph.2021.101020

Setiadi, D., Nurhayati, S., Ansori, A., Zubaidi, M., & Amir, R. (2023). Youth's digital literacy in the context of community empowerment in an emerging society 5.0. Society, 11(1), 1-12. https://doi.org/10.33019/society.v11i1.491

Sharma, S., Kar, A. K., Gupta, M. P., Dwivedi, Y. K., & Janssen, M. (2022). Digital citizen empowerment: A systematic literature review of theories and development models. Information Technology for Development, 28(4), 660-687. https://doi.org/10.1080/02681102.2022.2046533

Sorwar, G., Aggar, C., Penman, O., Seton, C., & Ward, A. (2023). Factors that predict the acceptance and adoption of smart home technology by seniors in Australia: a structural equation model with longitudinal data. Informatics for Health and Social Care, 48(1), 80-94. https://doi.org/10.1080/17538157.2022.2069028

Tajudeen, F. P., Bahar, N., Tan, M. P., Peer Mustafa, M. B., Saedon, N. I., & Jesudass, J. (2022). Understanding user requirements for a senior-friendly mobile health application. Geriatrics, 7(5), 110. https://doi.org/10.3390/geriatrics7050110

Tirado-Morueta, R., Rodríguez-Martín, A., Álvarez-Arregui, E., Ortíz-Sobrino, M. Á., & Aguaded-Gómez, J. I. (2023). The digital inclusion of older people in Spain: Technological support services for seniors as predictor. Ageing & Society, 43(6), 1409-1435. https://doi.org/10.1017/S0144686X21001173

Urbina, S., Tur, G., & Fernández, I. (2022). Active ageing with digital technology: seniors' usages and attitudes. IxD&A, 54, 54-84. https://doi.org/10.55612/s-5002-054-003

Wang, K., Zhou, L., & Zhang, D. (2024). Biometrics-Based Mobile User Authentication for the Elderly: Accessibility, Performance, and Method Design. International Journal of Human-Computer Interaction, 40(9), 2153-2167. https://doi.org/10.1080/10447318.2022.2154903

Xiao, Y., Chen, Z., & McNeil, L. (2022). Digital empowerment for shipping development: A framework for establishing a smart shipping index system. Maritime Policy & Management, 49(6), 850-863. https://doi.org/10.1080/03088839.2021.1894364

Zhang, C. (2022). Smartphones and telemedicine for older people in China: opportunities and challenges. Digital Health, 8, 20552076221133695. https://doi.org/10.1177/20552076221133695

Zhang, Y., Wu, D., Zhao, Y., & Zhu, Q. (2023, July). When Seniors Meet Digital: An Investigation on the Antecedents and Consequences of Smartphone Dependence Among Urban Older Adults. In International Conference on Human-Computer Interaction (pp. 279-294). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-48041-6_20