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# Increasing Health Awareness and Changing Consumer Behavior as Mediating Rolein Promoting the Impact of Corona Pandemic Towards Use of E-Services

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***Abstract:*** -This study aims to investigate the impact of the coronavirus (COVID-19) pandemic on using online services in Jordan. In this study, we adapted the descriptive survey. Coronavirus, one of the murderer's known viruses, has already taken the lives of many in almost the entire country. This means that all economic sectors in the country have closed down. Organizations and governments are responding quickly in several ways, actions that are especially important to protect lives and support work-from-home (WFH) procedures. The duty is challenging for organizations and governments that depend intensely on in-person interaction for all sectors. Social distancing, reduction of unnecessary operations, and decreased interaction are essential in protecting human health—and they increase critical challenges about how these governments and organizations can continue to reach customers and fulfill their expectations.

Therefore, this coronavirus is expected to impact Changi's first case in Jordan strongly. The government has taken many procedures like lockdown of all sectors and borders to prevent this virus from spreading, and a primary study has been carried out to get a better result.

***Keywords****: Coronavirus (Covid-19), E-Service, E-Government, Consumer Behavior, Health Awareness*

## 1. Introduction

The coronavirus (COVID-19) pandemic has a wide-reaching effect on e-government, e-services, e-business, and all sectors of the economy (Cox et al., 2020). It has already disrupted the lives of many people. In addition, every country follows the stay-home and social distance procedures to prevent the spread of the virus all over the countries, and the Hashemite Kingdom of Jordan has also adopted the same procedures. We notice here that the private and public sectors have been affected byhow their service is delivered to citizens. Due to this virus, the government has increased the number of electronic platforms and services that help citizens complete all their necessary transactions. The private sector has also been quick to improve the provision of electronic services, which contribute to alleviating the suffering of citizens due to this pandemic Because of the novel coronavirus and as a result of these government measures to deal with this pandemic. Citizens should be motivated and directed towards using electronic services to save their lives and relieve pressure on the government and private facilities. This requires a double effort by governments to clarify and explain the use of these services to increase citizens' trust when using these electronic services. Before the pandemic, the Jordanian government had been moving towards the transformation of the digital economy by changing the name of the Ministry of Communications and Information Technology to the Ministry of Digital Economy and

Entrepreneurship; this transformation included Digital Entrepreneurship, Digital Platforms, Digital Financial Services, Digital Infrastructure, and Digital Skills. This shift and this pandemic have contributed to some degree in changing the behavior of citizens toward the use of electronic services, which has also helped to move towards electronic services, which is the quality of telecommunications infrastructure in the kingdom.

**2. The importance of this study**

This study derives its importance from the significant impact of this pandemic (the Corona pandemic), which led to the disruption of all aspects of life in its standard form, which led to the closure of all sectors all over the world, and the transition to the electronic system in all areas of life. Therefore, it is necessary to know the role of health awareness and its effect in changing The behavior of citizens towards the trend in the increase in the use of electronic services in light of the coronavirus pandemic, which enhances and mitigates the impact of this pandemic on all sectors, whether public or private. To save more effort, time, and money.

3. **Objectives**

Identify the importance of public health awareness and its role in changing behavior and the role of the coronavirus pandemic in increasing the trend towards the use of electronic services by citizens by answering the following questions

1.To estimate the role of the pandemic and how it can affect changing consumer purchasing behavior

2.To understand the relationship between health awareness and increasing public consumer purchasing behavior toward the use of e-service.

3.To determine the role of the pandemic towards the use of electronic services by increasing health awareness and changing behavior

**4. Problem Statement**

As a result of the coronavirus (COVID-19) epidemic, and after the first case in Jordan appeared, the government has taken many procedures like lockdown all sectors and borders to prevent this virus from spreading in the home country and protect citizens from this virus. Also, the government launched many e-service applications to enhance and help citizens perform all vital processes related to all aspects of life. Depending on these procedures, we note the increase in demand for e-applications and e-services from citizens. For these reasons, we are trying to analyze the degree of use of these applications by Jordanian citizens during this pandemic.

**5. Study questions**

This study aims to answer the following questions:

1. To what extent has the coronavirus pandemic affected the increasing trend toward the use of electronic services
2. How does increased health awareness affect changing citizens' behavior towards adapting to the current situation
3. Has the Corona pandemic increased health awareness?
4. Is there an impact on health awareness and behavioral change in increasing the trend towards using electronic services?

**6. Hypotheses**

Hypothesis 1 (H1): The COVID-19 epidemic significantly changes consumer behavior.

Hypothesis 2 (H2): COVID-19 is significantly increasing public health awareness.

Hypothesis 3 (H3): Health awareness is significantly increasing in changing consumer behavior.

Hypothesis 4 (H4): Increasing public health awareness significantly

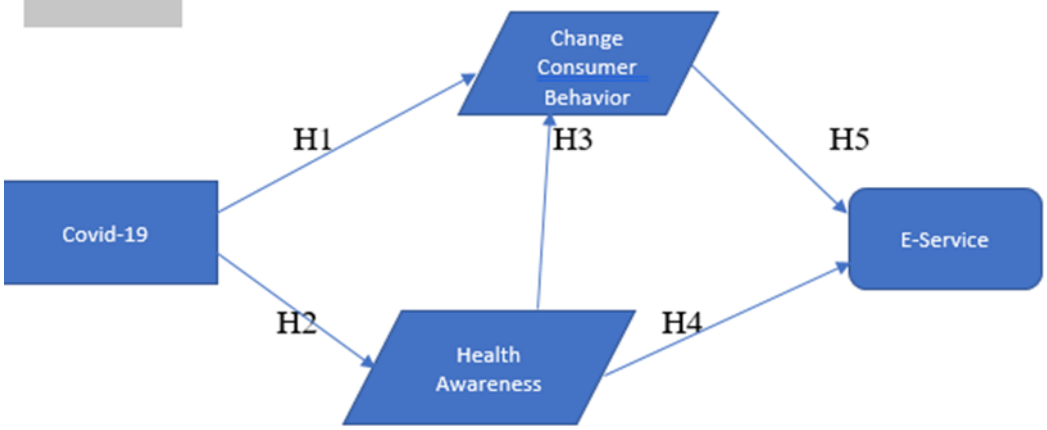
mediates the relationship between the COVID-19 epidemic and using e-service.

Hypothesis 5 (H5): consumer behavior change significantly mediates the relationship between the COVID-19 epidemic and the use of e-services.

**7. Conceptual Framework**

Depending on previous studies, the problem statement, and its questions, the following Conceptual framework has been developed for this study on the impact of COVID-19 as an independent variable by mediating variable consumer change and health awareness towards the use of E-Services from Jordanian as the dependent variable, as shown in the model below.

(Figure 1).




**8. Literature Review**

**8.1 E-service**

At the end of the 20th century, with the increasing and rapid growth of the Internet and its use in all areas of life, especially e-commerce and e-services. As a result of changes in consumer behavior towards using e-service and e-commerce depending on the organizational reputation, perceived risk relative advantage, and perceived service quality [2]. Many reasons have led to the increased provision of electronic services. One of these reasons for using electronic services is that they increase the range of options for customers, and the development of services may improve the value of the relationship between the particular company and customer and the service after the sale, allowing for service differentiation, and decrease the cost of service [3]. Electronic service is the application of information technology in different areas of life. E-services are interactive software-based information systems received via the Internet. They have been stated as "business processes, computing resources, assets—information, applications—made available via the Internet to drive new revenue streams and create competencies [2]. "E-services range from the electronic provision of traditional services (services with an e in front), such as investing and airline ticketing, to intelligent interactivity in post-sales product support"[3]. The coronavirus pandemic has also disrupted daily life throughout the countries, and cities have become isolated from each other, disrupting supply chains, the provision of services to citizens, following social spacing; citizens need to use electronic applications that relate to all areas of life, like online shopping, e-service, distance learning. Depending on these reasons, the government in Jordan faced many challenges related to how citizens interact with a wide swath of sectors like insurance, banking, industrial service, telecommunication, education, hospitality, social distance, reduction of nonessential operations, and limited contact are fundamental in protecting human health and increasing how can these organization dealing with this new changes and how to reach all customers [4]. The Jordan government quickly responded to this unique situation to safeguard lives and support work from home (WFH); the e-government launched many platforms and a wide range of services to enhance and sustain the economy. The e-government has

approximately 295 services in all institutions and ministries. The e-government launched the application of Sanad, which combines e-government services in one place, in the name of one user and one secret number, and is connected. More than 100 digital services are present in the application of Sanad, and all citizens need to activate the smart card, which will contain an electronic signature. E-government aims to reach 392 services. As new practices take hold to decrease contact among employees and customers, organizations can start to reevaluate their processes and operating models. Both to enable safe scale-up and to accelerate toward approaches that minimize contact [4].The e-service is being driven into significant motivation due to the pressure from the COVID-19 pandemic. The e-service is the dependent variable since the increase or the decrease in the demand for the particular online platform significantly depends on the widespread COVID-19 pandemic and the changing customer behavior towards dealing with this pandemic to protect them from infection. The COVID-19 pandemic helped and motivated people to learn how to use these applications that the government delivers to safeguard themselves against COVID-19.

**8.2 Coronavirus (Covid-19)**

Covid-19 is considered one of the most infectious diseases, which is mainly widespread worldwide. The disease spread very quickly and reached almost every part of the world. The coronavirus jumped outside of China, and cases and deaths have been stated in other countries. As of 6 November 2020, Time 06:39 PM, the total number of confirmed cases reached 47889201 worldwide; the total number of deaths reported in the world was 1221196 deaths. Jordan lockdown all borders on 14 March 2020. After only a few COVID-19 cases appeared around the country, the Jordanian government took unusual procedures, including implementing severe emergency laws. Travel constraints were forced on passengers in Jordan; all unauthorized travel into and out of the country and between cities was stopped. No pharmaceutical physical distancing interventions, such as extended school and university closures and workplace distancing, were introduced to reduce the impact of COVID-19. The Jordanian Ministry of Digital Economy and Entrepreneurship launched many e-services to prevent the spread of the coronavirus pandemic. The COVID-19 pandemic is rushing its transition towards digital services in a very significant way. The citizens of the country are expected to be practicing social distancing. Coronavirus is identified as an independent variable because consumer behavior in the nation and the world has been influenced significantly. Based on this exceptional pandemic, the country's people have forced higher restrictions upon individuals and businesses. This disease has caused a large number of disasters in the world economy. Coronavirus has been presented as the independent variable in this study since the entire economy and the whole population's well-being have been affected by this pandemic to a greater extent[5].

**8.3 Consumer Behavior &Health Awareness**

Customer behavior is also considered as the independent variable. The main reason behind its independence is how the people will respond to the COVID-19 pandemic [6]. Due to the significant impact of this epidemic, the customers will take necessary precautions and be more likely to act accordingly. Therefore, the customer's behavior in Jordan mainly influences the need for e-service activities to a great extent. The customer's behavior would be affected by the closures in the country since there would be an absence of availability of products and services. For this reason, the customer should depend mainly on the e-service platform to fulfill the necessities required to protect them from infection. To perform all these activities, consumers need to adopt new technologies that facilitate, study, work, and consumption in a more comfortable manner[7]. Another reason for the closure is the extreme increase in the usage of the Internet and social media[8]. The COVID-19 epidemic persuaded significant shifts in consumer purchasing behavior of fresh vegetables[9]. The COVID-19 outburst poses an inimitable opportunity to study how markets are created and disappear within a limited time. It would also be interesting to explore whether the disappearance of one solution for a market may be replaced by another (e.g., combustion engines for electric or physical teaching for online teaching. COVID-19 helped E-commerce attract more customers because everything was closed, and people were afraid to step out of their houses, so they chose to buy goods online, and many new customers also joined.[10]. consumer behavior is affected by the prevalence of the Covid-19[11]. The work-life restrictions are now clear as people study, work, and relax at

home. Since the consumer cannot go to the store, the store has to come to the consumer[7]. Social media platforms positively impact awareness of public health behavioral changes[12].

**8.4 Health Awareness**

Behavior changes depending on the model of Health Belief Model were first launched in the 1950s by the U.S. Health Public Service[13]. This model was successfully implemented to explain several health behaviors, like helmet use, weight reduction, vaccination, and nutritional consumption [14], [15]. The continuing closure to fight COVID-19 The current Pandemic influences brand and category preferences, shopping behavior, and spending [16].

Social distancing, wearing masks, avoiding public meetings, hygiene, and loneliness. Involvement in promoting public health can improve the quality of health in society and fight the outbreak and spread of infectious diseases[12]. The stay-at-home and social distancing to fight the COVID-19 virus has caused significant disruptions in consumer behavior. All consumption is time-certain and location-bound. With time flexibility but location rigidity, consumers have learned to invest in creative and innovative ways. The work-life boundaries are now unclear as people study, work, and relax at home. Since the consumer cannot go to the store, the store has to come to the consumer[7]. At the same time, service organizations will need to be more flexible for the duration of the current public health interventions and the ensuing economic revival. Businesses must prepare to surpass in a world where today's emergency becomes a changed way of doing business[4]. Interventions from the government aimed at promoting the use of e-services can improve the quality of life in society and support the policies and programs run by the government in fighting the outbreak and spread of infectious diseases. If citizens are friendly with using these services and trust them, they are likely to respond positively toward using these services.

**9. Methodology**

We will use the quantitative method to achieve the objectives and answers for all questions in this study. The descriptive-analytical approach has been adopted in interpreting results and testing hypotheses through the use of confirmatory analysis and path analysis by (AMOS).

This study was conducted in the Hashemite Kingdom of Jordan, and all Jordanian society members were considered the study population. As for the study sample, it consisted of all academic levels in Jordan and the sampling unit.

To achieve the desired goals for this study, we designed and employed a questionnaire. Then, the questionnaire was prepared in Arabic and distributed via the social media platform to pick up from all citizens in the kingdom to reach a fair sample for this study. During the period 15/11-5/12/2020, study questions were developed based on previous studies and using a 5-point Likert scale ranging from (1) strongly disagree to (5) strongly agree, and then distributed this questionnaire via social media Facebook, WhatsApp, Telegram, LinkedIn, and we received only 343 respondents. After in-depth analysis excluded 20 respondents, invalid information was elevated to achieve high accuracy results. In total, 323 questionnaires were considered valuable and fit for this study at a rate of 5%, similar to online studies, which had to rate the online survey 5% [17], 9.68 [18].

**Reliability and validity**

Factor loadings, Cronbach alpha, and composite reliability for the variables were calculated to determine the reliability and validity of the study model, and we found Cronbach alpha for all items (86.6).

**Statistical analysis**

**Table 1. Sample profile (N=323), n (%).**

The result shows that (58.8%) of males and (41.2%) of females aged 20-35 (27.6%), 36-45 (38.1%), 46-55 (24.5%), and more than 55(9.9%)

| | Characteristic | Value | frequency | Percent 100% |
|---|---|---|---|---|
| 1 | gender | Male | 190 | 58.8 |
| | | female | 133 | 41.2 |
| | | Cumulative | 323 | 100 |
| | | | | |
| 2 | Age | 20-35 | 89 | 27.6 |
| | | 36-45 | 123 | 38.1 |
| | | 46-55 | 79 | 24.5 |
| | | More than 55 | 32 | 9.9 |
| | | Cumulative | 323 | 100 |
| | | | | |
| 3 | Education level | Tawjehee and less | 13 | 4 |
| | | Diploma | 23 | 7 |
| | | Bachelor | 141 | 43.7 |
| | | Master | 76 | 23.5 |
| | | Ph.D. | 70 | 21.7 |
| | | Cumulative | 323 | 100 |
| | | | | |
| 4 | Governance | Amman | 60 | 18.6 |
| | | Irbid | 40 | 12.4 |
| | | Zarqa | 28 | 8.7 |
| | | Aqaba | 27 | 8.4 |
| | | Tefillah | 14 | 4.3 |
| | | Karak | 18 | 5.6 |
| | | mafraq | 37 | 11.5 |
| | | Salt | 22 | 6.8 |
| | | Ajloon | 16 | 5 |
| | | Jerash | 15 | 4.6 |
| | | Maan | 20 | 6.2 |

| | | | | |
|---|---|---|---|---|
| | | Madaba | 26 | 8 |
| | | | 323 | 100 |

**Table 2 Descriptive statistics for study items and variables**

| Category | Item | Mean (S.D.) | Level | Order |
|---|---|---|---|---|
| Covid-19 | Cov1 | 3.89 (0.9) | High | 3 |
| | Cov2 | 4 (0.90 | High | 2 |
| | Cov3 | 4.1 (0.71( | High | 1 |
| Consumer Behavior | CONSB1 | 4.1 (0.44) | High | 1 |
| | CONSB2 | 4 (0.47) | High | 2 |
| | CONSB3 | 3.68 (0.65) | High | 3 |
| | CONSB4 | 3.62 (0.66) | Moderate | 4 |
| E-service | ESERV1 | 3.9 (0.5) | | 5 |
| | ESERV2 | 4 (0.5) | High | 2 |
| | ESERV3 | 3.78 (0.63) | High | 4 |
| | ESERV4 | 3.9 (0.43) | High | 3 |
| | ESERV5 | 4.03 (0.4) | High | 1 |
| | ESERV6 | 3.4 (0.78) | Moderate | 6 |
| Health awareness | HAWR1 | 4.10 (.66) | High | 3 |
| | HAWR2 | 4.23 (0.62) | High | 2 |
| | HAWR3 | 4.27 (0.65) | High | 1 |
| Overall items | | | | |
| Covid-19 | | 4.05 (0.47) | High | 2 |
| CONSUMER BEHAVIOR | | 3.86 (0.5) | High | 4 |
| E-SERVICE | | 3.86 (0.34) | High | 3 |
| HEALTH AWARENESS | | 4.22 (0.5) | High | 1 |

Notes : Cov …… Covid-19

Consb…… Consumer Behavior

HAWAR……Health Awareness

ESERV……E-service

**Exploratory Factor Analysis**

In this study, exploratory factor analysis is used to collect information

about study variables. The result of the KMO test was 0.795, and all items were higher than 0.50; consequently, all items were used in the data analysis to acquire the investigated latent variables. Also, for the multicollinearity issue, the results show that the variance inflation factor for each variable was less than 2, suggesting that multicollinearity was not an issue. The outputs also show the lack of shared method bias in that the first factor did not give for most of the variance, and no single factor occurred from the factor analysis.

**Confirmatory Factor Analysis**

Confirmatory factor analysis (CFA) was done to underline the properties of the study items. A researcher has stated that the measurement model is how latent variables or hypothetical variables are assessed under the circumstances of observed variables, representing how the reliability and validity of the observed variables respond to the latent variables.

Figure 2 shows the measurement model and the correlations between the four study variables; it can be seen that all variables were correlated. The primary CFA model introduced an acceptable fit to an improved fitting measurement model without removing any items. The goodness of fit indices of the evaluation of the primary study model noted that the prior model's outcomes could be considered the final model. CFA showed that for the model, chi-square = 110.821, p=.10 implies that the measurement model fitted the data. Also, CMIN/DF=1.192 is an absolute fit index. The incremental appropriate index of 0.973, the Tucker-Lewis index of 0.964, the comparative suitable index of 0.972, and the root mean square error of approximation of 0.025 all meet the threshold of <1 for sufficient criteria. The measurement model indicated a good sample data fit based on these fit indices.

Measurement model showing the correlations among the four research variables.

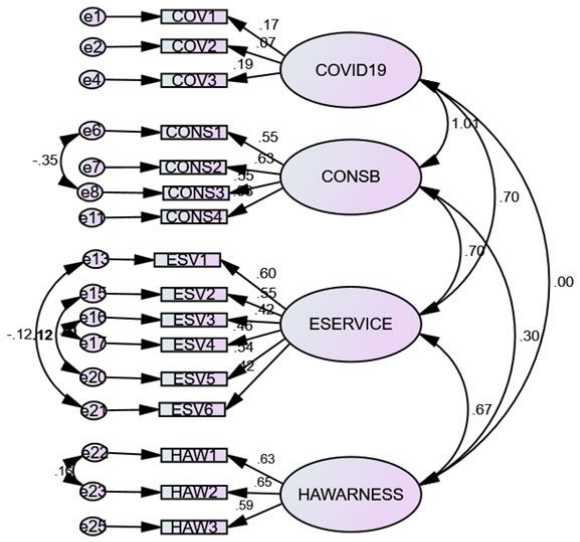


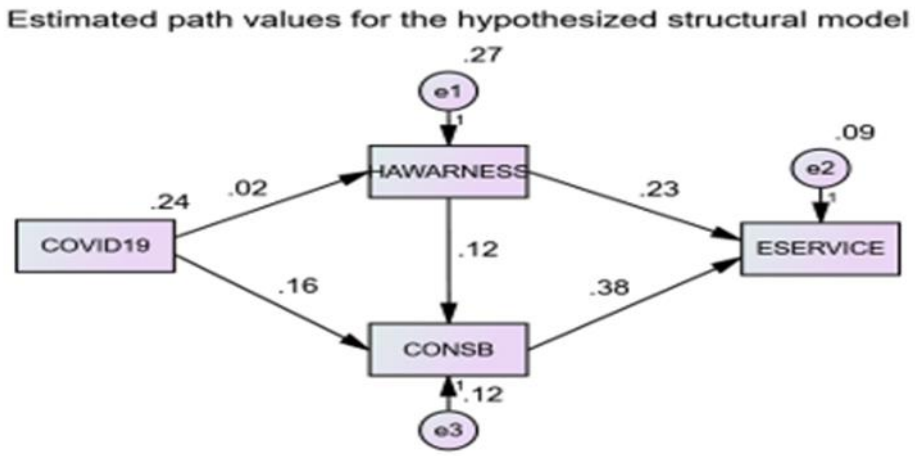

**Figure 2**

**Results and testing hypotheses**

**Table 3. Path analysis results for hypotheses 1 to 5. For all hypotheses, P<.001.**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| HAWARNESS | <--- | COVID19 | -.019 | .058 | -.323 | .747 | par_3 |
| CONSB | <--- | COVID19 | .143 | .040 | 3.551 | *** | par_2 |
| CONSB | <--- | HAWARNESS | .105 | .039 | 2.671 | .008 | par_4 |
| E-SERVICE | <--- | CONSB | .359 | .047 | 7.673 | *** | par_1 |
| E-SERVICE | <--- | HAWARNESS | .207 | .033 | 6.196 | *** | par_5 |

**Figure 3**




To examine the mediating effects of consumer behavior, health awareness, and covid-19 on the use of e-service, we considered both direct and indirect effects. It was found that health awareness and consumer behavior change significantly affected e-service directly and indirectly (H1 and H5), resulting in total effect sizes of p=0.046. As a result, the data support is completely mediating.

**Principal Findings**

In this study, we aimed to explore the impact of COVID-19 on using e-service through behavioral changes and public health awareness as mediating factors for Jordanian people. A conceptual framework was developed based on a previous study to achieve the study goals and conduct the research using a systematic approach. The potential benefits of the pandemic are to promote and enhance the use of e-services for all citizens and encourage all sectors to launch these services to save time and money for each other. The analysis presented empirical evidence regarding the impact of COVID-19 on changing consumer behavior in hypothesis 1. This hypothesis significantly and positively supported the linkage between COVID-19 and purchasing consumer behavior.

Furthermore, the analysis provided empirical evidence regarding the effectiveness of public health awareness on general consumer behavior changes, as proposed in H3. The results showed that the effect was positive and significant. Therefore, H2 regarding the impact of purchasing consumer behavior on using e-service, this hypothesis is significantly and positively supported. The fourth and fifth hypotheses were developed to determine whether there were mediating effects of public health awareness and changing purchasing consumer behavior on the relationship between the use of e-service and COVID-19. The results clearly stated that health

awareness changes in consumer behavior mediated the effects of COVID-19 on the use of e-service; however, the mediating effect was wholly affected. Additionally, the results indicated a significant and positive indirect effect of COVID-19 using services through health awareness and changes in consumer behavior; we find the total impact = with standardized indirect effects as shown in the following.

**Table (4) Total Effects - Two-Tailed Significance (B.C.) (Group number 1 - Default model)**

| | COVID19 | AWARENESS | CONSB |
|---|---|---|---|
| AWARENESS | .856 | ... | ... |
| CONSB | .004 | .029 | ... |
| SERVICE | .041 | .006 | .005 |

The results showed a significant statistical effect of COVID-19 on e-services, with the mediating effects of health awareness and consumer behavioral changes. The practical total effect (P<.041). These results indicated that COVID-19 significantly and indirectly positively impacted the use of e-services. COVID-19 also directly affected consumer behavior change; this effect was significant, as was the impact of using e-services. However, no previous empirical research studies have examined the mediating effects of health awareness and consumer behavioral changes on the relationship between COVID-19 and e-services. Therefore, the results confirm that health awareness and consumer behavioral changes have vital mediating effects on the relationship between COVID-19 and e-service, and the degree of mediation was complete. This supports H4 and H5. Furthermore, the main statistical results supported the predictive validity of the conceptual model for this study.

**Conclusion**

Our findings suggest that the coronavirus pandemic can indirectly influence e-services by mediating consumer behaviors and health awareness, positively impacting changing consumer behavior, and having no effect on health awareness, which means health awareness exists. The government may use social media platforms to increase consumer behavior change through awareness campaigns towards increasing the transformation of electronic services, which it launched in cooperation with all sectors. This change helped face uncertain conditions and improve and promote the e-government. Therefore, it leads to increased social distance and prevents the spread of disease.

**Conflicts of interest**

There is no conflict between the authors declared for this publication.

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