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COVID-19'un Türk Çevrimiçi Perakende Tüketicilerinin Perakende İnternet Sitelerine Ziyaret Davranışları Üzerindeki Etkisi

COVID-19's Effects on Turkish Online Retail Consumers' Retail Website Visiting Behavior

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ÖZ

COVID-19 pandemisi insanların çalışma ve sosyalleşme de dahil olmak üzere hayatları üzerindeki etkileriyle ekonomiyi küresel ölçekte etkilemiştir. Pek çok insanın uzaktan çalışma ve kendini karantinaya alma gibi önlemler uygulaması kaçınılmaz olarak bu yeni normalde alışveriş de dahil olmak üzere günlük alışkanlıklarını değiştirmelerine neden olmuştur. Bu çalışma çevrimiçi alışveriş yapan kişilerin çevrimiçi perakende sitelerini ziyaretlerinin açıklanan günlük COVID-19 yeni vaka, ölen ve iyileşen sayılarıyla ilişkilerini araştırmayı hedeflemektedir. Çalışmanın sonuçları genel olarak çevrimiçi perakende sitelerinin ziyaret edilme sayılarıyla COVID-19'un Türk hükümetinin büyükşehirlerde 10/04/2020 tarihinde büyük şehirlerde ilk kez ilan ettiği sokağa çıkma yasağıyla 01/08/2020 tarihi arasındaki dönemdeki ilerleyiş arasında bir korelasyon olduğunu göstermektedir. Bunun yanında, Türkiye'de 01/07/2020 tarihinde yurtiçi seyahat ve toplu taşıma gibi hizmetlerin yeniden başlayacağı ve halka açık mekanların yeniden açılacağına Cumhurbaşkanı Sn. Erdoğan tarafından duyurulduğu 28/06/2020 tarihini "normalleşme sürecinin" başlangıcı olarak belirlenmiştir. Veriler normalleşme sürecinin başlangıç gününden ikiye ayrıldığında da çalışılan tarihler arasında bazı istisnalar dışında hem normalleşme öncesi hem de normalleşme süreçlerinde korelasyonlar olduğu görülmektedir. Bunun yanı sıra aynı kategoriden çevrimiçi perakende sitelerinin oluşturduğu bazı şablonlar tespit edilmiştir. Sonuçlar çevrimiçi perakende sitelerinin günlük ziyaret edilme sayılarının günlük Türkiye Sağlık Bakanlığı'nın COVID-19 istatistikleriyle korelasyonunu ortaya koymuş; dolayısıyla çevrimiçi tüketici davranışının COVID-19 pandemisinden etkilendiği yargısına ulaşılmıştır.

ABSTRACT

The COVID-19 pandemic has affected the economy on a global scale with its impacts on the way people work, socialize, shop and more. With many people started working remotely, and adopting self-quarantine like measures, the changes they make in their lives inevitably shaped a new normal where they change their daily habits, shopping included. This study aims to find out how the online shoppers' online retailer website visits are affected by the revealed daily new cases, deaths, and recoveries from COVID-19 pandemic. Results of the study shows that there is a strong correlation, in general, between the daily online retailer website visit numbers and daily COVID-19 progression in Turkey between the dates of 10/04/2020, the day Turkish government first announced a curfew in all major cities, and 01/08/2020. Further, 28/06/2020 is identified as the start of the "normalization period" as it was the date President Erdoğan made it public that Turkey was to resume intra-country transportation, public transportation services, and public places were to re-open on 01/07/2020. When the data is split from the start of the normalization process, it was seen that the correlations still exist with some exceptions in pre-normalization and normalization periods within the studied dates. Also, three patterns that websites from the same online retail category follow are defined. The results suggest that the online retailer websites' number of visits are correlated with the COVID-19 statistics revealed by the Turkish Ministry of Health; ergo the online consumers' behavior is affected by COVID-19 pandemic.

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GENİŞLETİLMİŞ ÖZET

Bu çalışmada hem sıradan tüketicinin günlük yaşantısını ve alışveriş alışkanlıklarını hem de küresel ekonomiyi etkileyen COVID-19 salgınının tüketicilerin çevrimiçi perakende sitelerini ziyaret sayıları üzerindeki etkisi araştırılmıştır. Araştırma için aylık ortalama ziyaretçi sayıları 500,000 ve üstü olan çevrimiçi perakende sitelerinden genel perakende (çok kanallı), perakende market ve perakende teknoloji siteleri kategorilerinden oluşan on bir internet sitesi incelenmiştir. Çalışmada incelenen genel perakende şirketleri Gittigidiyor, Hepsiburada, N11, Sahibinden ve Trendyol'un çevrimiçi alışveriş siteleridir. Çevrimiçi market alışverişine yönelik internet siteleri A101, Carrefoursa ve Migros; Çevrimiçi teknoloji marketler ise Mediamarkt, Teknosa ve Vatanbilgisayar'dır. Çalışmanın başlangıç tarihi olarak Türkiye'de büyük illerde COVID-19 pandemi sürecinde sıkı önlem olarak sokağa çıkma yasağının ilk uygulanış tarihi olan 10/04/2020 tarihi seçilmiş, süreç 01/08/2020 tarihine kadar takip edilmiştir.

Bu tarihler arasında tüketicilerin bu internet sitelerine giriş sayılarıyla Türkiye Cumhuriyeti Sağlık Bakanlığı'nın (TCSB) günlük olarak açıkladığı yeni vaka, yeni ölüm ve yeni iyileşen sayıları arasında bir ilişki olup olmadığı ortaya çıkarılmak istenmiştir. Bu problemin çözümü için üç aşamalı bir yol izlenmiştir. Birinci aşamada yukarıda belirtilen zaman dilimi içerisinde genel anlamda tüm sitelerin ziyaretçi sayılarıyla TCSB'nin günlük verileri arasında bir korelasyon olup olmadığı sınıanmıştır. Genel anlamda sitelerin tamamına yakınının ,05 anlamlılık düzeyinde TCSB'nin açıkladığı günlük verilerle korelasyona sahip olduğu gözlemlenmiştir. Bu gözlemin ardından ilk sokağa çıkma yasağıyla normalleşme süreci arasında davranışsal bir farklılık olup olmadığı araştırılmak istenmiştir. Bunun için grafiksel analiz yapılarak seçilen internet sitelerinin günlük ziyaretçi sayılarının normalleşme sürecinin duyurulduğu 28/06/2020 tarihinden önce ve sonra gözle görünür bir fark gösterip göstermediği incelenmiştir. Grafiklerden edinilen bilgi çalışılan çevrimiçi alışveriş sitelerinin grafiklerinin bir kısmının gözle görünür bir biçimde iki dönem arasında farklılaştığı kanısına ulaşılmıştır. Bu bilgi ışığında en azından kimi çevrimiçi alışveriş siteleri için normalleşme sürecinin öncesinde ve normalleşme sürecinde farklı davranışlar gözlemlenmesi gerektiği sonucuna ulaşılmıştır. Bu hipotezi test etmek için ise TCSB verileri normalleşme öncesi ve normalleşme süreci için ayrı ayrı test edilmiş, bazı internet sitelerinde görülen korelasyonların 28/06/2020 tarihinden sonra ortadan kalktığı veya yön değiştirdiği gözlemlenmiştir.

Bunun yanı sıra genel süreçte genel perakende alışveriş sitelerinin, Normalleşme öncesi dönemde teknoloji perakende sitelerinin ve normalleşme sürecinde çevrimiçi market sitelerinin diğer kategorilerden belirtilen zaman dilimleri için farklılaşan şablonlar oluşturduğu görülmüştür. Çalışmanın konu edindiği zaman diliminin tamamı göz önünde bulundurulduğunda çevrimiçi genel alışveriş sitelerinin TCSB'nin açıkladığı günlük COVID-19 ölüm sayılarıyla negatif korelasyona sahip olduğu, normalleşme öncesi dönemde çevrimiçi teknoloji perakende sitelerinde TCSB'nin günlük yeni ölüm verileriyle negatif korelasyona sahip olduğu ve normalleşme sürecinde çevrimiçi market sitelerinin TCSB'nin günlük yeni vaka verileriyle negatif korelasyona sahip olduğu ortaya çıkarılmıştır.

Çalışmanın özgün değeri çevrimiçi tüketici davranışının kitlesel hareketini inceleyen çalışmaların kısıtlı olmasından ileri gelmektedir. SARS ve AIDS hastalıklarının başlangıç süreçlerinde tüketicilerin davranış farklılıklarını çalışan makaleler olmakla birlikte bu makaleler çoğunlukla teknoloji kabul modeli (TAM) yardımıyla bireysel tüketicilerin sağlık krizleri sürecindeki satın alma niyetini ve niyetin satın almaya dönüşmesini incelemektedir. Bu çalışma konu edindiği internet sitelerini kullanan tüketicilerin ne kadarının satın alma niyetine sahip olduğu veya ne kadarının satın alma niyetlerini eyleme dönüştürdüğünü ölçmekten ziyade çevrimiçi tüketicilerin perakende web sitelerini ziyaret etme davranışlarındaki değişimin açıklanan günlük COVID-19 yeni vaka, ölen ve iyileşen sayılarıyla ilişkisini anlamayı hedeflediğinden özgün bir katkıda bulunması ümit edilmektedir. İnternet sitelerinin ziyaretçilerinin arzu edilen davranışı (bu çalışma için satın alma) gösterme yüzdesi olarak tarif edilen dönüşüm oranının çevrimiçi perakende siteleri için küresel olarak %2.5 olduğu bilinmektedir. Bu bilgi de perakende sitelerine yapılan ziyaretlerin alışverişin bir fonksiyonu olarak kabul edilebileceğini gösterdiğinden çalışmanın reel sektör için de katkı sağlayacağı ümit edilmektedir.

Introduction

The outbreak of the COVID-19 pandemic affected everyone's life in terms of socialization, healthcare, in some cases the way people work, and even the way people shop. With almost 20 million confirmed cases and a death toll over 700 thousand, as of August 09th, 2020 (WHO, 2020) the pandemic is still threatening lives all around the world on a daily basis. Such drastic figures caused governments and individuals to seek and apply measures that are not a part of the "normal" life. Many governments reacted to the lingering threat with precautions such as quarantines, implementing mandatory facemask zones, curfews, delaying and/or digitizing schools/universities, delaying sports events, and more.

With the governments still adapting to the "new normal", public and individuals also had to change their lives as they knew it. Many people are avoiding crowded places, not leaving their homes unless there is an absolute necessity, wearing facemasks in public and workplaces. Given that the pandemic influences everyone's social, professional, and daily lives, it can be expected to observe a change in consumer behavior too. Expecting many consumers to be reluctant to leave their homes to go shopping under the current situation is only logical. Therefore, the precautions, curfews, and other factors that limit the mobilization of consumers should have an observable effect on daily visits on e-commerce sites.

Attempting to understand the state of the changes, daily visit numbers of 11 e-commerce websites are collected and the correlation between daily visits and figures data from the Turkish Ministry of Health are examined.

Literature Review

With the internet evolution, shopping activities, along with almost any other activity, took its share of change. By 2000, more than three thirds of the consumers in the USA have already either searched, examined, or compared products online but less than 35% of those shoppers actually made a purchase (Sisimero and Bucklin, 2004). Risks, and convenience of online shopping have also been examined and studied from as early as 2000 (Bhatnagar et al., 2000; McKnight et al., 2002). Bhatnagar et al. attempted to find out why some people do not go online for shopping whereas others do. Many other scholars also aimed to compare online and offline shopping behavior by comparing advantages and disadvantages of both (e.g. Andrews and Currim, 2004; Ramus and Nielsen, 2005). With both papers point out that the online shopping is more convenient than the alternative, it can be said that those whose priority is convenience would lean towards online shopping more often.

With the motives under normal circumstances are more or less understood, many other scholars asked another important question: who are the online shoppers? Hui and Wan (2009) have shown in their study that the most frequent and adept online shoppers were those of age between 21 and 40. Arguably, the technology acceptance is a big factor for internet shopping, but they also showed that demographic factors such as age and income level have an impact on online shopping behavior. Many other factors' relevance in consumers' online purchase were also studied by scholars, such as price, availability, scarcity and more (Bucko et al., 2018).

Technology acceptance model (TAM) is also a frequent tool for researchers for predicting consumers' online purchase behavior (Amoroso & Hunsinger, 2009) and used for predicting the repurchase intention of online shoppers in literature (Chiu, Chang, Cheng and Feng, 2009). The main conclusion from these studies can be said as that higher the consumer is integrated with the technology of internet, higher the chances are for purchasing and re-purchasing goods online. İşçioğlu (2018), on the other hand, showed that situational factors are as important as the TAM in terms of predicting consumers' online purchase behavior. She also

points out the importance of the perceived physical, time, and financial benefits are major factors for online shoppers.

Another question that the researchers search for an answer for the retail websites along with who the buyers are, can be shown as how much is sold. In other words, web retailers' common goal is to increase their conversion rates (Ayanso and Yoogalingam, 2009). The conversion rate can be explained as the percentage of visitors who become buyers in short (McDowell, Wilson, and Kile Jr, 2016). How to increase the conversion rate has been studied by the researchers to come up with an answer to the question of how much is sold and how. The evidence from the literature shows that consumers who search in prior have a higher probability of buying the product (Moe, 2003; Schlosser, White and Lloyt, 2006). Global conversion rates are about 2.5% for retail websites (Monetate, 2018). Most of the e-retail websites have conversion rates between 1% and 5% whereas about a quarter of the sites have 5% to 20% conversion rates (Zumstein and Kotowski, 2020). One of the common outcome considering the definition of conversion rates in the literature is that the visit numbers is a function of sales.

Though the literature on consumers' purchase behavior during crises is not very rich, two notable papers can be shown as relevant studies. The first one shows that the online grocery sales initially increased in Singapore during a SARS outbreak in 2003 (Hui and Wan, 2009). They conclude that the consumers tend to use online grocery stores as long as they perceive their sites useful and easy to use, and that a health crisis has an effect on online grocery shopping. The second paper, though it is not on online shopping, shows that consumers change their behaviors during crisis times (Ballantine, Zafar and Parsons, 2014). The research concludes that the shoppers' behavior and motivations are affected by sudden and catastrophic changes in their environment. In theory, the presence of an unexpected crisis would result in a change in consumers' purchase behavior, therefore it should be visible on the number of website visits. COVID-19 being a recent health crisis and with the lack of empirical research on how online shoppers' e-tail website visits, which is a function of sales, change in general, this paper aims to provide insights for how online shoppers' retail website visiting frequency react to the presence of a pandemic, and how it varies based on different online retail categories.

Methodology

This study aims to point out the differences in consumers' change in e-commerce website visit behavior during the COVID-19 pandemic period in Turkey. For this purpose, daily visit numbers of 11 e-commerce sites of organizations based in Turkey are collected from WebsiteIQ (WebsiteIQ, 2020), a website traffic data provider. In order to be able to understand the nature of the relationship between website visit behavior of online consumers and the progression of COVID-19 pandemic in Turkey, official daily confirmed cases, daily death, and daily recovered data is manually collected from Turkish Health Minister Dr. Fahrettin KOCA's official public twitter account (KOCA, 2020), where he shares the daily detailed situation. A less detailed, confirmatory data can also be found at the ministry's official COVID-19 webpage: <https://covid19.saglik.gov.tr/> (T.C. Sağlık Bakanlığı, 2020).

Described data are exported to an MS Excel sheet and indexes created for visual simplification in graphs. The same data are also exported to the SPSS program and correlation analysis is run for the subject websites and the ministry of health data. The data is limited to the dates from 10/04/2020, the day in which Turkish government imposed strict precautions such as total curfew and lockdown in 31 cities for the first time (T.C. İçişleri Bakanlığı, 2020), to 01/08/2020. The table below shows the websites studied, and their category:

Table 1: Retail websites, categories, and average monthly web visitors

Site name	Category	Monthly Average Web Visitors
A101	Grocery retail	1,195,267
CARREFOURSA	Grocery retail	533,323
GİTTİGİDİYOR	Retail (General)	6,891,202
HEPSİBURADA	Retail (General)	16,029,337
MEDİAMARKT	Technology retail market	1,361,710
MİGROS	Grocery retail	1,441,768
N11	Retail (General)	16,321,259
SAHİBİNDEN	Retail (General)	24,581,726
TEKNOSA	Technology retail market	1,333,841
TRENDYOL	Retail (General)	16,242,411
VATANBILGISAYAR	Technology retail market	2,323,711

As it can be seen from Table 1, all the e-commerce sites, except carrefoursa, attract over one million desktop visitors per month. There are five general retail sites, three grocery retail sites, three technology retail sites, and one retail catering site. Sites below 500.000 average monthly visitors are ignored in this study for simplification purposes.

The initial analysis conducted was checking for the correlation of data from the ministry of health and individual daily web-site visit numbers. Significant correlations are found between all of the sites and the ministry data. Detailed information and analyzes are provided in the “Results and Findings” chapter. The second part of the analysis was comparing the websites’ graphs created with MS Excel. Graph analyzes showed that the increase/decrease in the visit numbers revert after some point. This information led to the thought that the so-called “normalization” process also influenced consumers’ website visit behavior. Thus, the study calls for a third analysis: if the significance or the direction of the correlation changes after a point. In order to test the hypothesis that the consumers’ behavior shows a difference before and after the start of the normalization, general data is divided in two: pre-normalization and normalization dates. On 28/06/2020, President Erdoğan revealed that the normalization process was to be started on 01/06/2020, as cafés and restaurants and other various public places were to be re-opened, and intra-country travels were to be resumed on 01/06/2020 (Türkiye Cumhuriyeti Cumhurbaşkanlığı, 2020). Since the normalization process was first revealed on 28/06/2020 evening, the following day can be considered as the perceived start of the normalization. Therefore, data was split from the day following the normalization process was revealed, rather than the day it actually started. After the data is split into two, each sites’ correlation values are compared for pre-normalization and normalization periods. The results are presented in the “Results and Findings” chapter.

Results and Findings

As described in the methodology chapter, the first step was checking if there are any correlations between the websites’ number of daily visits and daily COVID-19 cases, daily deaths, and daily recovered patients. The table below shows the correlations between the selected internet sites and daily cases. The effect size for correlation is defined in literature as 0,1 to 0,3 being low effect, 0,3 to 0,5 being moderate effect and 0,5 and above being a high effect for both positive and negative correlations (Cohen, 1992). Pearson correlation coefficients (r) and significance levels (p) are presented in tables.

Table 2: Correlations of retail website visits with daily new COVID-19 cases

Website	Category	Correlation With Daily New Cases
A101	Grocery retail	r: -,466 / p: ,000
CARREFOURSA	Grocery retail	r: ,360 / p: ,000

GİTTİGİDİYOR	Retail (General)	r: -,737 / p: ,000
HEPSİBURADA	Retail (General)	r: -,012 / p: ,895
MEDİAMARKT	Technology retail market	r: -,466 / p: ,000
MİGROS	Grocery retail	r: ,831 / p: ,000
N11	Retail (General)	r: -,856 / p: ,000
SAHİBİNDEN	Retail (General)	r: -,615 / p: ,000
TEKNOSA	Technology retail market	r: -,107 / p: ,254
TRENDYOL	Retail (General)	r: -,929 / p: ,000
VATANBİLGİSAYAR	Technology retail market	r: -,295 / p: ,001

As the table shows, all of the websites show a correlation with daily cases at ,05 significance level except Hepsiburada and Teknosa. Negatively correlated sites are A101, Gittigidiyor, Mediamarkt, N11, Sahibinden, Trendyol and, Vatanbilgisayar whereas Carrefoursa and Migros are the only positively correlated sites.

The following table shows the correlations between the subject websites and daily death numbers:

Table 3: Correlations of retail website visits with daily new COVID-19 deceased cases

Website	Category	Correlation With Daily Deceased Cases
A101	Grocery retail	r: -,437 / p: ,000
CARREFOURSA	Grocery retail	r: ,238 / p: ,011
GİTTİGİDİYOR	Retail (General)	r: -,842 / p: ,000
HEPSİBURADA	Retail (General)	r: -,217 / p: ,020
MEDİAMARKT	Technology retail market	r: -,437 / p: ,000
MİGROS	Grocery retail	r: ,942 / p: ,000
N11	Retail (General)	r: -,795 / p: ,000
SAHİBİNDEN	Retail (General)	r: -,795 / p: ,000
TEKNOSA	Technology retail market	r: -,106 / p: ,260
TRENDYOL	Retail (General)	r: -,923 / p: ,000
VATANBİLGİSAYAR	Technology retail market	r: -,404 / p: ,000

Different from the previous table, the only site with a significance level higher than ,05 is Teknosa in this otherwise similar table. As a preliminary conclusion, it can be said that the number of visits to Hepsiburada is affected by daily deceased cases, but not from daily discovered cases.

The next table shows the correlations between daily recovered cases and the studied websites:

Table 4: Correlations of retail website visits with daily new COVID-19 recovered cases

Website	Category	Correlation With Daily Recovered Cases
A101	Grocery retail	r: -,238 / p: ,011
CARREFOURSA	Grocery retail	r: -,369 / p: ,000
GİTTİGİDİYOR	Retail (General)	r: -,467 / p: ,000
HEPSİBURADA	Retail (General)	r: ,533 / p: ,000
MEDİAMARKT	Technology retail market	r: -,238 / p: ,011
MİGROS	Grocery retail	r: ,351 / p: ,000
N11	Retail (General)	r: ,009 / p: ,920
SAHİBİNDEN	Retail (General)	r: -,508 / p: ,000
TEKNOSA	Technology retail market	r: -,371 / p: ,000
TRENDYOL	Retail (General)	r: -,323 / p: ,000
VATANBİLGİSAYAR	Technology retail market	r: -,318 / p: ,001

Table 4 shows that only n11 is not correlated with daily recovery numbers, and only Hepsiburada and Migros are positively correlated with otherwise predominantly negatively correlated set of websites.

The second part of the research involves graphical analyzes of selected websites over time. For time and space-saving purposes, websites of the same category are presented together below:

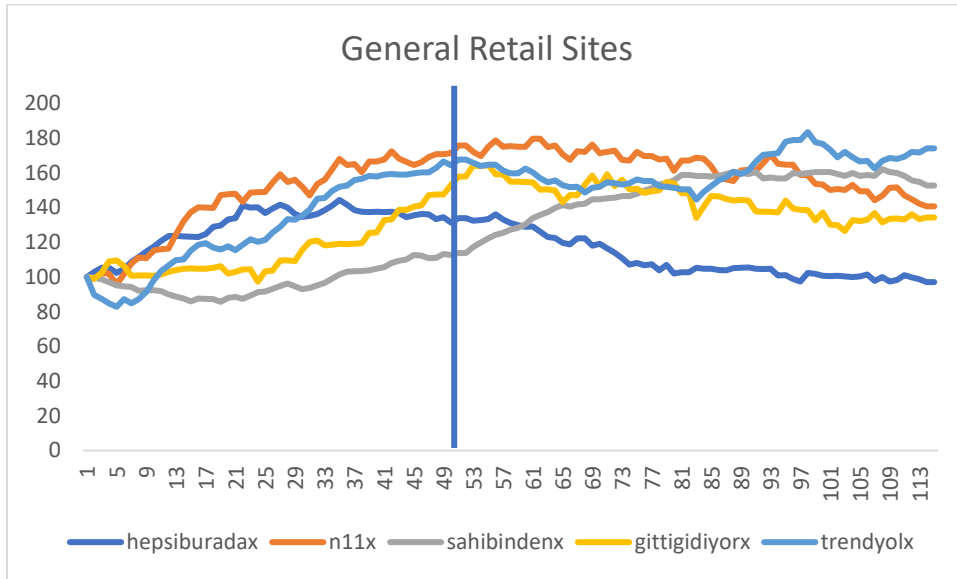


Figure 1: Daily number of visitors graph for general retail webpages

The vertical line on roughly day 50 of the study represents the day when the start of the normalization process is made public by President Erdoğan. The change of trend roughly around the 50th day is visible for some of the websites.

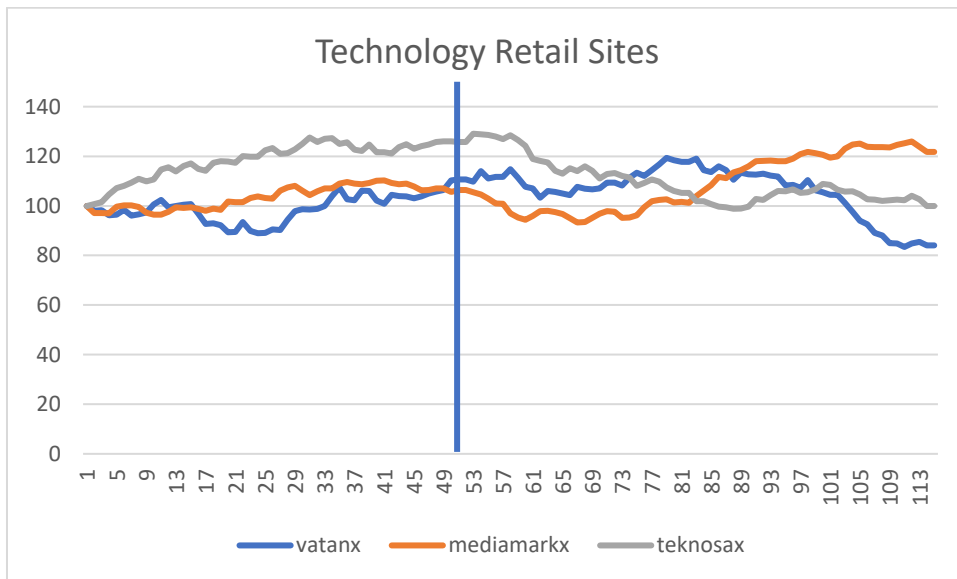


Figure 2: Daily number of visitors graph for technology retail webpages

The same change of trend can be observed around the same days in this graph too. The change in Teknosa's line is especially visible.

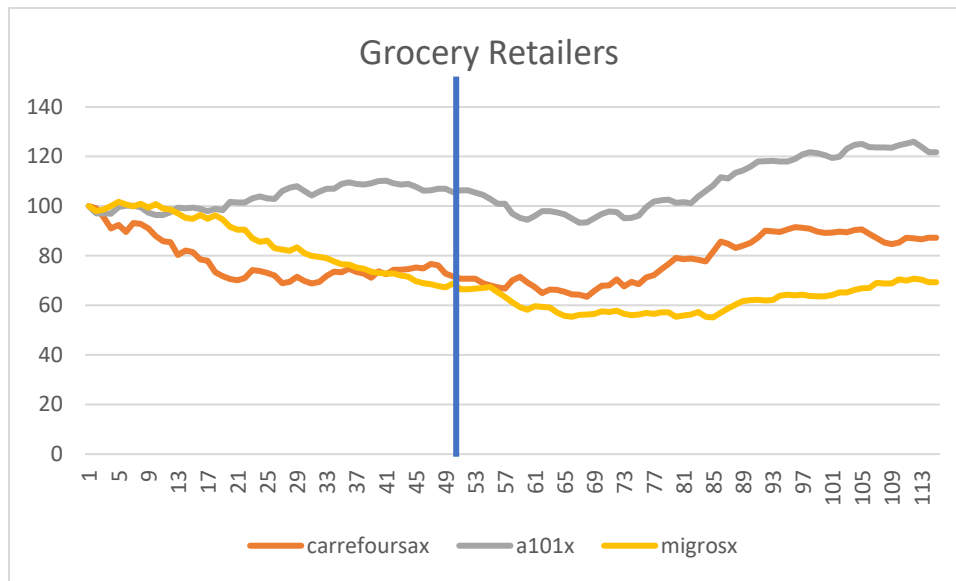


Figure 3: Daily number of visitors graph for grocery retail webpages

The graphs show that at least some of the sites' daily visits reacted to the normalization process announcement by the president of Turkey. Therefore, two separate time slices should result in different results in terms of correlations with the ministry of health data for at least some of the websites covered in this study. The last part of the research is reserved to test the hypothesis mentioned after graphical analyzes.

The table below shows the correlations of websites' daily desktop visitors with the ministry of health data, split into two parts as pre-normalization (Pre) and normalization (Nor) periods.

Table 5: Correlations of retail website visits with daily new COVID-19 cases

Website	Category	Correlation With Daily New Cases
A101	Grocery retail	(Pre) r: -,843 / p: ,000 (Nor) r: -,585 / p: ,000
CARREFOURSA	Grocery retail	(Pre) r: ,869 / p: ,000 (Nor) r: -,453 / p: ,000
GİTTİGİDİYOR	Retail (General)	(Pre) r: -,719 / p: ,000 (Nor) r: ,247 / p: ,046
HEPSİBURADA	Retail (General)	(Pre) r: ,881 / p: ,000 (Nor) r: -,010 / p: ,934
MEDİAMARKT	Technology retail market	(Pre) r: -,834 / p: ,000 (Nor) r: -,585 / p: ,000
MİGROS	Grocery retail	(Pre) r: ,902 / p: ,000 (Nor) r: -,759 / p: ,000
N11	Retail (General)	(Pre) r: -,954 / p: ,920 (Nor) r: ,324 / p: ,008
SAHİBİNDEN	Retail (General)	(Pre) r: -,486 / p: ,000 (Nor) r: ,098 / p: ,435
TEKNOSA	Technology retail market	(Pre) r: -,902 / p: ,000 (Nor) r: -,110 / p: ,379
TRENDYOL	Retail (General)	(Pre) r: -,920 / p: ,000 (Nor) r: -,720 / p: ,000
VATANBILGISAYAR	Technology retail market	(Pre) r: -,261 / p: ,070 (Nor) r: ,360 / p: ,003

The table shows that there have been seven changes in either type or the existence of the correlation between daily new cases and the inspected websites. Carrefoursa's positive

correlation became negative, Gittigidiyor's negative correlation became positive, Hepsiburada's positive correlation became insignificant, Migros' positive correlation became negative, n11's no correlation became positively correlated, Sahibinden's negative correlation became insignificant, Teknosa's negative correlation became insignificant, Vatanbilgisayar's no correlation became negative correlation with the start of the normalization process. The next table shows the difference between correlations of daily deceased patients with the subject websites:

Table 6: Correlations of retail website visits with daily new COVID-19 deceased cases

Website	Category	Correlation With Daily Deceased Cases
A101	Grocery retail	(Pre) r: -,921 / p: ,000 (Nor) r: -,300 / p: ,014
CARREFOURSA	Grocery retail	(Pre) r: ,670 / p: ,000 (Nor) r: -,292 / p: ,018
GİTTİGİDİYOR	Retail (General)	(Pre) r: -,871 / p: ,000 (Nor) r: ,495 / p: ,000
HEPSİBURADA	Retail (General)	(Pre) r: ,728 / p: ,000 (Nor) r: ,420 / p: ,000
MEDİAMARKT	Technology retail market	(Pre) r: -,921 / p: ,000 (Nor) r: -,300 / p: ,014
MİGROS	Grocery retail	(Pre) r: ,965 / p: ,000 (Nor) r: -,032 / p: ,797
N11	Retail (General)	(Pre) r: -,868 / p: ,000 (Nor) r: ,447 / p: ,000
SAHİBİNDEN	Retail (General)	(Pre) r: -,751 / p: ,000 (Nor) r: -,516 / p: ,000
TEKNOSA	Technology retail market	(Pre) r: -,764 / p: ,000 (Nor) r: ,440 / p: ,000
TRENDYOL	Retail (General)	(Pre) r: -,922 / p: ,000 (Nor) r: -,011 / p: ,928
VATANBILGISAYAR	Technology retail market	(Pre) r: -,417 / p: ,003 (Nor) r: ,406 / p: ,001

As it is shown in the table, there have been seven changes in websites' visit numbers' correlation with the daily deceased patients after the normalization process' revelation. Carrefoursa's positive correlation became negative, Gittigidiyor's negative correlation became positive, Migros' positive correlation became insignificant, N11's negative correlation became positive, Teknosa's negative correlation became positive, Trendyol's negative correlation became insignificant, and Vatanbilgisayar's negative correlation became positive. The next table shows the correlations of subject websites' daily desktop visitors with daily recovered patients data.

Table 7: Correlations of retail website visits with daily new COVID-19 recovered cases

Website	Category	Correlation With Daily Recovered Cases
A101	Grocery retail	(Pre) r: -,017 / p: ,907 (Nor) r: -,315 / p: ,010
CARREFOURSA	Grocery retail	(Pre) r: -,613 / p: ,000 (Nor) r: -,191 / p: ,126
GİTTİGİDİYOR	Retail (General)	(Pre) r: -,359 / p: ,011 (Nor) r: ,211 / p: ,089
HEPSİBURADA	Retail (General)	(Pre) r: ,508 / p: ,000 (Nor) r: -,227 / p: ,067
MEDİAMARKT	Technology retail market	(Pre) r: -,017 / p: ,907 (Nor) r: -,315 / p: ,010
MİGROS	Grocery retail	(Pre) r: ,036 / p: ,805 (Nor) r: -,337 / p: ,006

N11	Retail (General)	(Pre) r: ,289 / p: ,044 (Nor)r: ,384 / p: ,004
SAHİBİNDEN	Retail (General)	(Pre) r: -,584 / p: ,000 (Nor) r: -,095 / p: ,448
TEKNOSA	Technology retail market	(Pre) r: ,354 / p: ,013 (Nor) r: ,102 / p: 417
TRENDYOL	Retail (General)	(Pre) r: ,016 / p: ,911 (Nor) r: -,273 / p: ,027
VATANBILGISAYAR	Technology retail market	(Pre) r: -,723 / p: ,000 (Nor) r: ,343 / p: ,005

The table shows that 10 of the 11 sites' correlations have changed after the revelation of the normalization process. A101's non-significant correlation became negatively correlated, Carrefour's negative correlation became insignificant, Gittigidiyor's negative correlation became insignificant, Hepsiburada's positive correlation became insignificant, Media market and Migros' non-significant correlations became negatively correlated, Sahibinden's negative correlation became insignificant, Teknosa's positive correlation became insignificant, Trendyol's non-significant correlation became negatively correlated, and Vatanbilgisayar's negative correlation became positively correlated with the daily recovery numbers.

The information gathered from the tables and graphs are evaluated and discussed in the "Discussion and Limitations" chapter.

Discussion and Limitations

With all the tables provided in "Results and Findings" chapter, it can be concluded that the COVID-19 had an impact on consumers' e-retail website visiting frequencies in general. Full table is provided in Abstract A for simplification, a summary of the results obtained from analyzes. Final analyzes show that there are certain patterns consumers follow in certain categories. First pattern occurs in general retail websites' visitor numbers. Consumers' daily visits to general retail sites are negatively correlated with the daily official deceased cases. It is that the number of visits fell as the revealed death numbers rise. The second pattern occurs in grocery retail category. All three grocery retail websites show negative correlation with the daily revealed new cases in normalization period. In other words, as the revealed new cases rise, consumers' daily website visits fell, and vice versa. The third pattern shows that all the technology retailer websites' visitor numbers showed negative correlation with daily deceased COVID-19 patients before the normalization process started. The pattern breaks after the normalization process is revealed.

In attempt to interpret the results, it can be said that the high negative correlation between general retail websites and daily COVID-19 deaths might suggest the connection between general retail websites' consumers' willingness to shop retail items when daily death numbers keep rising. This might be connected with the fear of death or getting sick, and consequently survival needs becoming more dominant in their shopping decisions for ordering goods from an environment that they have no control over. If this assessment is true, the same can be said for the consumers of grocery websites as they seem to refrain from shopping online if the new cases keep rising. The same correlation results can be interpreted the other way around too. This negative correlation suggests that the frequency of visiting, and consequently shopping from the grocery websites fall as the number of daily new cases rise, and this behavior points either of the two possible outcomes. Either consumers stopped shopping online because they adapted their lives to the new normal gradually, or they started stockpiling because of the perceived impending recurring crisis. Both explanations are consistent with the conclusions presented by Ballantine et al. (2013). This negative correlation between daily visitors of the select grocery retailer sites and daily new confirmed cases also show that if the number of daily new cases fall, grocery retailer websites' consumers should be more willing to shop online. The

last pattern also shows a similar reaction from the consumers. The number of visits fall as the as the daily deceased numbers rise before the normalization process started, then the pattern breaks as the correlations turn positive afterwards for Teknosa and Vatanbilgisayar's consumers, but it stays the same for Mediamarkt. This can be because Mediamarkt's consumers are different in some ways in comparison with other two technology retailer sites. However, with the data available, it is not possible to make such argument.

Even though correlations between studied websites' consumers' number of visits and the data from the ministry of health in general and in two specific time periods show correlations, this study lacks the information on the websites' conversion rates. Thus, despite the correlations found between number of visits and daily information on COVID-19 patients, without the conversion rates, it is impossible to speculate on how the purchase behavior changed, if changed at all. Because the conversion rates of the sites are not made public by the websites themselves, it is not possible to find out how purchase behavior is affected by (or correlated with) the number of visits that changed in accordance with the COVID-19 statistics. Another limitation of the study is the extent of the available data on website visit statistics. This means that the effect of seasonality can not be totally excluded. Although, even the presence of the COVID-19 pandemic and the measures taken by governments, public and the supply chains should be enough to explain the behavioral change in consumers' website visit frequencies, without the historical knowledge on seasonality, it is not possible to argue that seasonality had no effect on the results. Unfortunately, daily visit data for previous years are not kept by any of the internet traffic tracking sites that are known during the research took place.

Generalizability and Further Research

The study presents important insights on how consumers' reactions varied and created patterns in terms of e-retailer websites' daily visits under COVID-19 circumstances, because it is almost impossible to replicate the pandemic, it is impossible to retest the study for general confirmation. However, the study can be broadened by including more countries, and more categories given that the historical data is available. Another way to carry the study to the next level could be by somehow obtaining the conversion rates for each site during the studied time period to be able to explain if the volume of the consumption changed or not despite the change in number of times the websites are visited.

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Appendix A: Correlations summary chart

Website	Daily Ministry Data	General	Pre-Normalization	Normalization	Category
A101	New Cases	Negative	Negative	Negative	Grocery
	Deceased	Negative	Negative	Negative	
	Recovered	Negative	None	Negative	
CARREFOURSA	New Cases	Positive	Positive	Negative	Grocery
	Deceased	Positive	Positive	Negative	
	Recovered	Negative	Negative	None	
MİGROS	New Cases	Positive	Positive	Negative	Grocery
	Deceased	Positive	Positive	None	
	Recovered	Positive	None	Negative	
GİTTİGİDİYOR	New Cases	Negative	Negative	Positive	General
	Deceased	Negative	Negative	Positive	
	Recovered	Negative	Negative	None	
HEPSİBURADA	New Cases	None	Positive	None	General
	Deceased	Negative	Positive	Positive	
	Recovered	Positive	Positive	None	
N11	New Cases	Negative	None	Positive	General
	Deceased	Negative	Negative	Positive	
	Recovered	None	Positive	Positive	
SAHİBİNDEN	New Cases	Negative	Negative	None	General
	Deceased	Negative	Negative	Negative	
	Recovered	Negative	Negative	None	
TRENDYOL	New Cases	Negative	Negative	Negative	General
	Deceased	Negative	Negative	None	
	Recovered	Negative	None	Negative	
MEDİAMARKT	New Cases	Negative	Negative	Negative	Technology
	Deceased	Negative	Negative	Negative	
	Recovered	Negative	None	Negative	
TEKNOSA	New Cases	None	Negative	None	Technology
	Deceased	None	Negative	Positive	
	Recovered	Negative	Positive	None	
VATANBLGSYR	New Cases	Negative	None	Positive	Technology
	Deceased	Negative	Negative	Positive	
	Recovered	Negative	Negative	Positive	