Digital future beyond pandemic outbreak: systematic review of the impact of COVID-19 outbreak on digital psychology

Mudassar Khan, Nohman Khan, Samina Begum and Muhammad Imran Qureshi

Abstract

Purpose – *The globe has experienced a devastating COVID-19 pandemic, putting the planet under lockdown and causing social alienation. The near collapse of social and economic activities is disrupting the supply chain. Customer-required products were in low supply across the world. A slew of new digital firms springs up to fill the need during this time. This study aims to reach a holistic goal by better understanding customers' digitalisation behaviour. The first step is to review existing consumer digital psychology research to map this study's current knowledge of the pandemic's early and late phases and the impact of digital businesses on consumer behaviour. Finally, it provides lawmakers with a future agenda for limiting the digital psychology of consumers and enterprises.*

Design/methodology/approach – *This study used the Scopus and Web of Science databases to extract records to follow the preferred reporting items for systematic reviews and meta-analyses statement. The final 57 papers were applied after the screening process. The digital environment, psychological digitalisation and behavioural changes were recognised as three primary classes based on a comprehensive examination of the previous literature. This study identified possible difficulties in earlier literature: the scarcity of collaborative and transdisciplinary research on digital psychology, which various academics have emphasised in the past. On the other hand, these investigations were primarily conducted in the psychological surroundings of technology users.*

Findings – *According to this study, digital psychology has improved significantly during the pandemic and many new digital start-ups have arisen. This study also used digital research to create a framework for a pandemic strategic response plan to help minimise the current COVID-19 pandemic and prepare for future outbreaks.*

Originality/value – *The study mapped existing literature on digital psychology alterations because of the novel COVID-19 outbreak.*

Keywords *Digital psychology, COVID-19, Psychological digitalisation, Consumer psychology, Digitalisation, Technology, Social media*

Paper type *Literature review*

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1. Introduction

Humanity has endured a variety of serious health issues because of changes in the standard quality of soil, water, sky, air and fire, which have harmed people's well-being and health in many communities worldwide. Since the dawn of civilisation, people have been subjected to various epidemics and pandemics that have produced fear, damage, morality and mental health difficulties (Abbas *et al.*, 2021). However, coronavirus infectious illness is a continuing explicit strain of COVID-19 infection, which has caused severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) worldwide (Shuja *et al.*, 2020). Similarly, during the COVID-19 pandemic, the employment of technology in the form of information exchange, community awareness initiatives and digital labs that help inpatient treatments proved a significant ally of humanity in limiting the pandemic (Carpo, 2020; Irfan *et al.*, 2019). Simultaneously, people

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worldwide are questioning, “How are we going to work?” when fatalities continue to rise. “How are we expected to eat?” or, better still, “how are we supposed to eat?”

On the other hand, the coronavirus outbreak has irreversibly impacted consumer buying patterns and corporate operations. The amount of services we can access without leaving our homes expands exponentially every day (Mathivathanan and Sivakumar, 2021). Additionally, those who practise social distance or self-isolation are increasingly drawn to the products and services given by countless entrepreneurs in education, entertainment, shopping, cleaning and health. Government agencies advocate for the use of the e-government app. Data usage on the internet is also increasing (Daily Sabah, 2020). That also changed consumers’ psychological behaviours because of social distancing and possible threats because of the COVID-19 outbreak. However, the economist predicted a major economic recession in the coming years if the COVID situation is not under control (Paich, 2020). The current panic situation is essential to develop sustainable digital platforms to continue the world’s economic activities. Minimum movement restrictions also signal societies’ future in international travel and domestic movement. Businesses can move to another more reliable strategy if there is any pandemics crisis (Prior, 2020; Khan and Qureshi, 2020).

Recently, planet dealt with two significant coronaviruses before the COVID-19, SARS and MERS, but the damages are under control, and panic was also very limited in the states. However, the researchers failed to develop a plan and strategy for the next pandemic (Booth and Hills-evans, 2007). That period has caused more significant problems for the corporate world because of weak emergency preparedness and infrastructure. Because of inadequate emergency planning and infrastructure, the pandemic breakout phase has produced increasingly serious issues for the corporate world. Because of the COVID-19 breakout, supply chain activities were exposed, and manufacturing was delayed (Cai and Luo, 2020). Simultaneously, customers are restricted to staying at home and find it difficult to find market items (Woodhouse *et al.*, 2020). The problem will not be apparent after the pandemic because of the long-term psychological impacts of social isolation produced by COVID-19. The client avoided shopping in malls and crowded markets (Sigala, 2020). As a result, the psychological dread of customers provides a chance for the corporate sector to create alternative solutions (Emanuel *et al.*, 2020; Bt Jaafar *et al.*, 2020). However, internet buying and selling was a viable method for dealing with the problem (Claveria, 2019). According to Martin and Leurent (2017), technology is a powerful tool in influencing and changing consumer behaviour. As new technologies emerge to disrupt industries, companies of all sizes cannot afford to sit on the sidelines. In a world where new technologies pop up, companies that put consumer needs first can win.

Furthermore, Reeves and Nikolaus Lang (2020) expects the COVID-19 situation to impact our industries and society substantially. It is anticipated to accelerate online retail, online education and public health investments. It is also achieved by altering how corporations arrange their supply chains, further moving away from reliance on a few mega-factories (Mustapha *et al.*, 2021). When the most crucial aspect of the crisis has passed, businesses should analyse what has changed and what they have learned to incorporate it into their strategy (Ratten, 2021). However, some businesses are preparing intellectually for an unpredictable scenario caused by the COVID-19 outbreak worldwide, hurting significant economies such as China, the United States and Spain (Scenarios, 2020). Recent crises make the companies introduce new technologies that create a different way of fulfilling the wants and remove existing industry value processes. Disruption is also flowing from agile, innovative competitors who, thanks to access to global digital platforms for research, development, marketing, sales and distribution, can oust well-established incumbents faster than ever by improving the quality, speed or price at which value is delivered (Redjeki and Affandi, 2021). That will create the consumer and psychological comfort value in the digital availability of doorstep products. Law enforcement

institutions restrict consumers' movement to control the pandemic, and the future will continue if the outbreak is not managed, the pandemic becomes seasonal.

The primary goal of this study is to evaluate the influence of COVID-19 on consumer behaviour regarding digital psychology when purchasing online products. The present pandemic has significantly influenced consumer behaviour towards online goods purchases, developing consumer digital psychology. In addition, the current study will investigate the reasons behind technological adaptation behaviours and the development of digital psychology intention during the COVID-19 pandemic. The study's primary goal is to identify a solution to the present business crisis and consumer psychology concerning social distancing in COVID-19. They are considering using the new value chain method to avoid pandemic breakouts. The approach for reviewing the literature on coronavirus implications on consumer digital psychology is designed and two central databases, Scopus and Web of Science (WoS), are chosen for data gathering.

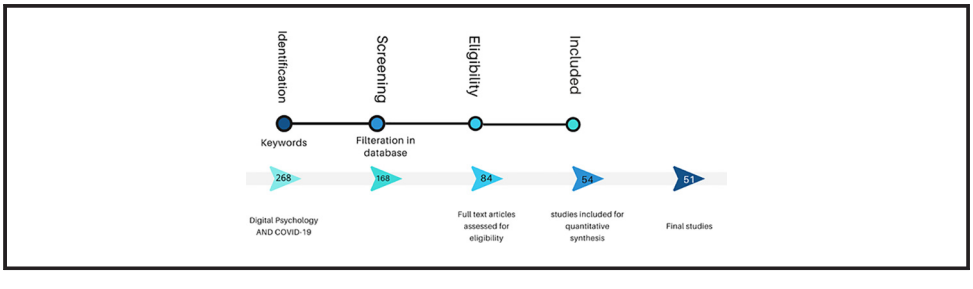
2. Materials and methods

The most recent outbreak of Coronavirus disseminated fear and severe threat to civilisation, but at the same time, it significantly reshaped the societies at large. The study analyses the past literature using a systematic literature review (SLR) approach (REYES, 2015). Preferred reporting items for systematic reviews and meta-analyses (PRISMA) framework templet used to explain the overall selection process and rejections of articles to review Coronavirus and digital psychology. PRISMA statement helps the researcher to improve the reporting of the review paper. This review is limited to published literature in the Scopus and WoS databases. The keywords used are "coronavirus" AND "digital psychology" to access the literature. A total number of 325 articles were listed on an initial search. The search then narrowed to the subject areas of social science, multidisciplinary, green sustainable science, psychology and scientific education discipline; the total number of research articles was 57.

The study is based only on articles, review papers and conference papers. To maintain the review's quality, every duplication is checked very thoroughly. The other significant problem was the citation checking during the study, and the process citation is checked very strictly. Abstracts and conclusions of the articles are checked deeply for the articles' analysis and purification to make sure they are at the possible level. A careful evaluation of each research paper was carried out later. The following exclusion criterion limited the papers published in the English language only. There was one article in the non-English language that was excluded from the study.

Furthermore, after the filtration of duplicate records, three more articles are removed from the study. We selected 51 articles after assessing each article on the inclusion and exclusion criteria, and Figure 1 shows the literature on inclusion and exclusion at every stage.

Figure 1 Literature search details (PRISMA framework)



3. Results

3.1 Descriptive analysis

We selected 57 articles after a careful inclusion and exclusion process. Only original articles, review papers and conference papers written in the English language available in Scopus and WoS databases were included in the review. Forty-six studies are based on full articles, and three review papers and two conference papers are included in the study. Figure 2 shows the results of document selection after the quality assessment.

According to the subject distribution of records, multidisciplinary topics provided thirty-four records to the current study. Moreover, social sciences provided six records, ranking second on the list. Other key disciplines include psychology, sustainable technology, and scientific education. Figure 3 shows the results of the subject-wise selection of the articles for the current study.

The study is not focusing on the specific time frame for the articles published in which year. The year-wise distribution's primary purpose is to understand the number of publications in

Figure 2 Distribution of articles based on article types

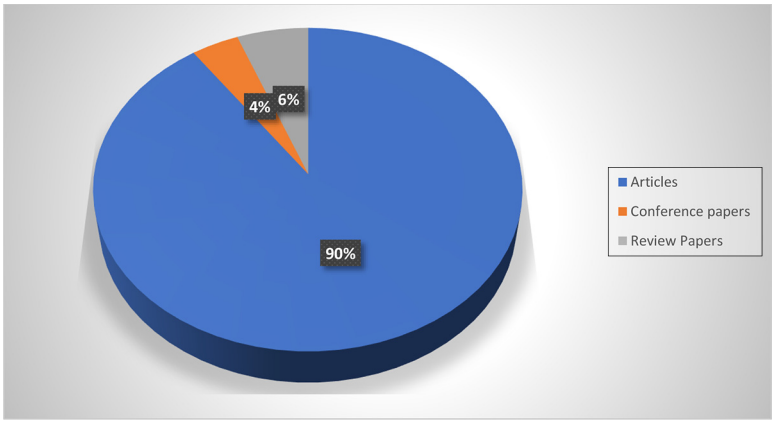
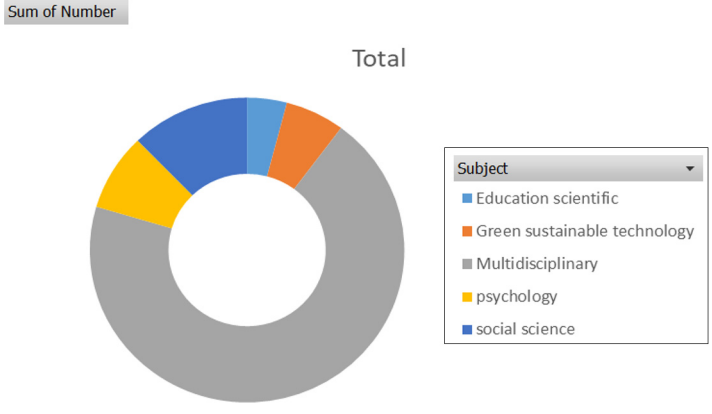


Figure 3 Distribution of research articles data labels on doughnut chart



a year selected and fulfil the review criteria. Figure 4 shows the year base graph of publications from 1997 to 2021. The year 2016 contributed the highest number with the six articles. The year 2013 is second on the list with five Coronavirus and digital psychology articles. The year 2008 contributed to the five studies. So, the number of contributions in the recent past is high rather than in the past. Figure 4 shows the detailed information of articles selected from the different years.

The recent study set the criteria of citations on the excel sheet. For the selection criterion in this study, the article was cited at least 10 times. Figure 5 shows the most cited papers selected for the current study, following in the footstep of eligibility criteria. The Proteus Effect: The effect of transformed self-representation on behaviour published in the *Human Communication Research Journal* is cited 474 times. Most other studies are "The Smartphone Psychology Manifesto", cited 268 times and published in *Perspectives on Psychological Science*. The third most cited study is "The unbearable likeness of being digital: The persistence of nonverbal social norms in online virtual environments", included in the current article 256 times cited.

Furthermore, the journal base publication analysis is conducted for the current study and finds that the *Computers in Human Behaviour Journal* has nine publications. Second, most

Figure 4 Article distribution (1997–2020)

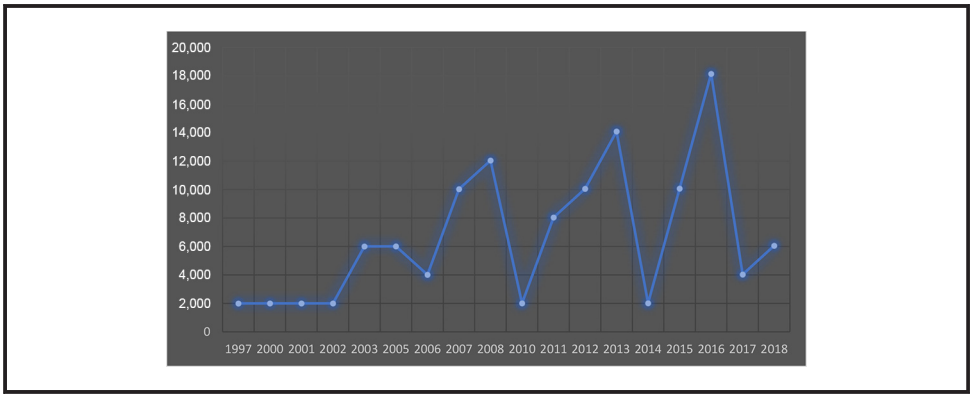
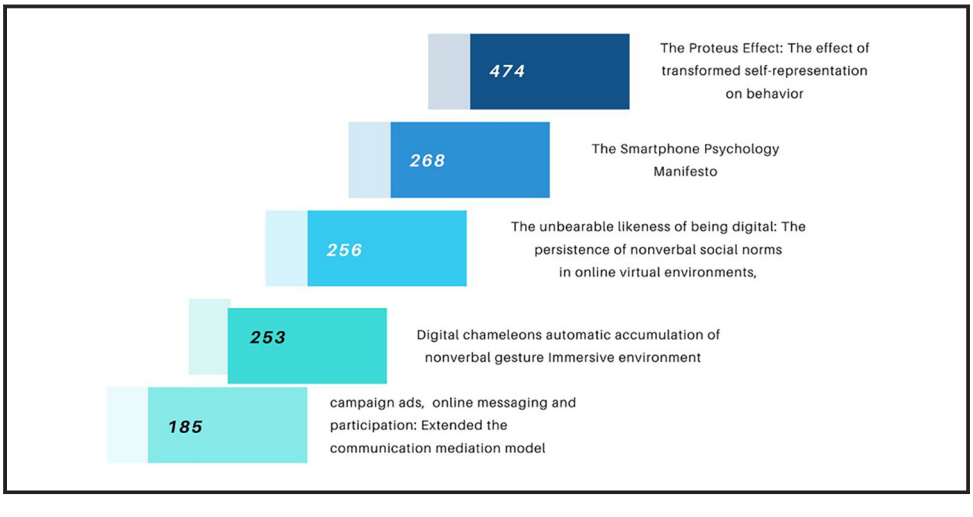


Figure 5 Highly cited papers



studies are selected from the *History of Psychology*, with five in number. Gradually, the number of studies is going down for the current study. In addition, four papers from each source were supplied by *Cyberpsychology & Behavior* and the International *Journal of Human-Computer Interaction*. Figure 6 shows the results of the article selected from each journal.

4. Classifications of literature on digital psychology

The studies were further analysed through content analysis to explore the research classifications. VOSViewer software was used to analyse the content of the published articles, and data based on the text were created to cluster the linked concepts. Current research makes confirmation that the authors used keywords and added them in the process. Recent research confirmed that author keywords and keywords added in the process of the publications' indexation in the databases are equally effective for bibliometric analysis to explore the structures of research fields. Figure 7 indicates the results of the content analysis. The network showed three major clusters, represented in different colours in Figure 7.

Figure 6 Distribution of publication on journal source

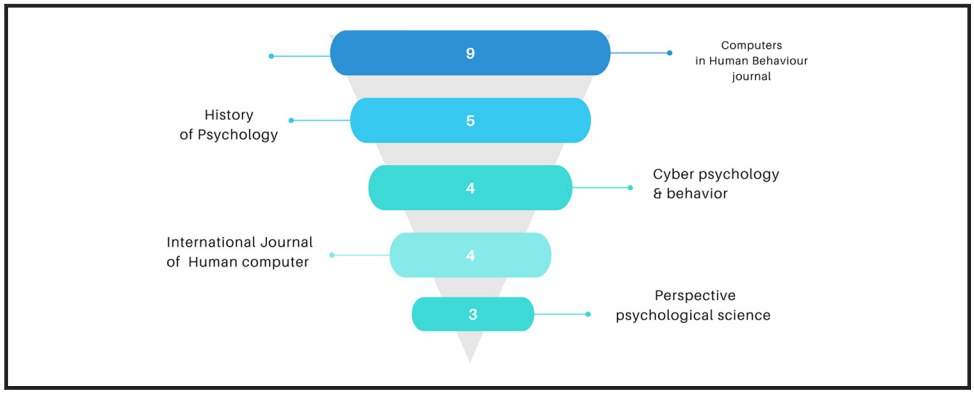
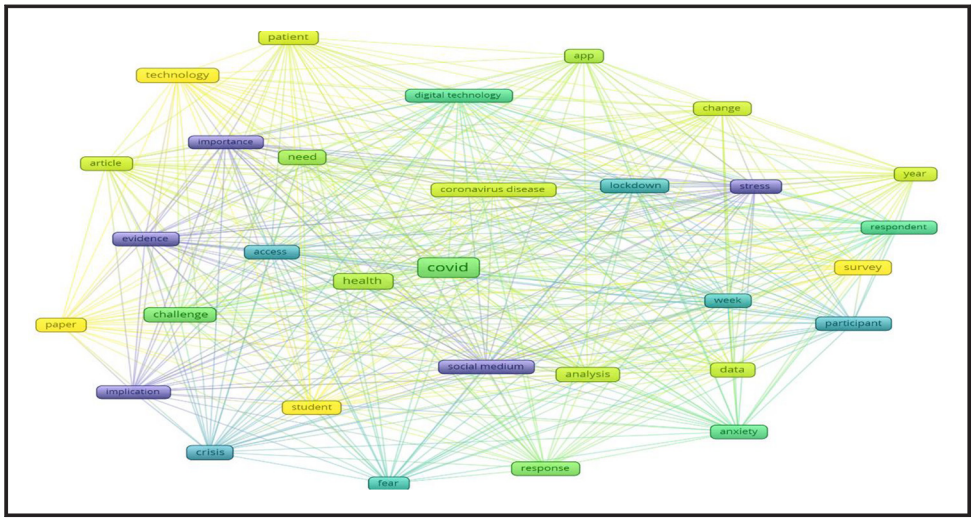


Figure 7 Research classifications using the text network technique



4.1 Digital technologies

The classification part related to digital psychology and COVID-19 literature is related to the digital world. COVID-19, a novel coronavirus, has a significant impact on consumers, and social distance paves the way for a new society without socialisation. Technology is gaining popularity in people's minds (Shaw *et al.*, 2018; Nohman Khan *et al.*, 2020). Literature has most of the work related to the psychological part of technology, and digitalisation supports the virtual environment. For enhancing digital behaviour, a study conducted in the literature shows that motivation and well-being are related to human-computer interaction for design strategies that change. The author builds this model based on existing evidence for essential psychological need satisfaction, including evidence within the workplace, scientific knowledge production, computer games and health (Peters *et al.*, 2018).

Furthermore, commercial and purchasing activities are progressively increasing through social media. Modern technology has also given us several digital gadgets that surround us: iPhones, iPods and videos are all connected to the internet or other internet-based networks (Vasile, 2012). However, the current situation is more critical for consumers' lockdown conditions and their way of thinking about digital shopping and entertainment. Bucko *et al.* (2018) suggested that the consumers are moving towards the digital mediums and companies need to understand the digital world's requirements. The digital age is very different from the traditional market business and consumers are more focused on evaluating the different options during the buying process. However, Yang *et al.* (2015) talk about digital goods in their study Digital Goods Are Valued Less Than Physical Goods; digitising goods into files that can be transmitted without a physical object is helpful in the lives of customers and their welfare. The study concluded that transforming digital goods has excellent potential and creates access to information and technology, reducing monetary and non-pecuniary costs such as transaction disutility and reducing the impact of production on the environment. Table 1 shows the author, title, setting, procedures and digital world literature findings.

Furthermore, in the digital world, companies need to understand the essential strategies for the companies. Many forms are integrated into a single product to supply the consumers. To successfully introduce a digitalisation/sterilization strategy, companies must change, among other things, their strategies, their operations and their value chain (Luz Martín-Peña *et al.*, 2018). COVID-19 is an excellent changer in businesses, many companies will not survive, but it is a more significant opportunity for some new start-ups. There is much uncertainty right now for small businesses, but there is an opportunity (Wang *et al.*, 2020). Pandemics are more dangerous for small-sized businesses, but in the digital world, small start-ups are a better opportunity to make the places using the social mediums and networks effectively to convey the message (Deshpande and Kaushal, 2017; Qureshi *et al.*, 2020a, 2020b). In the age of digital media, social media is a valuable instrument that plays an integral part in message delivery and communication. In recent years, brands and outlets have successfully employed social media platforms for digital marketing. Companies are putting up social media teams to promote their messaging and special offers (Pulido *et al.*, 2018). However, the digital world-related literature suggested that social media sites and proper feedback to ask questions are essential for the consumers' psychological position building. According to Morewedge *et al.* (2021), digital goods in their study Digital Goods Are Valued Less Than Physical Goods, the digitisation of goods into files that can be transmitted without a physical object are helpful in the lives of customers and their welfare. The study concluded that transforming digital goods has excellent potential and creates access to information and technology, reducing financial and non-pecuniary costs such as transaction disutility and reducing the impact of production on the environment. Social networks can create value for the goods to improve the products' quality and change the users' behaviours. Table 1 shows the author details, the title of the papers, the study's setting, the procedure and the study's findings.

Table 1 Literature on the digital world

Author	*Title*	*Setting*	*Procedure*	*Findings*
Green (2016)	A DIGITAL FUTURE FOR THE HISTORY OF PSYCHOLOGY?	Online database and tools	Digital skills	Digital history of the world is based on many different things, in a straightforward language moving from text electronic edition to world wide web is the raw material of digital history
Akhter (2003)	Digital divide and purchase intention: Why demographic psychology matters	Demographic variables	Digital divide	Earlier studies when looking at this point in a different angle about the individual level and perspective depend on the age, gender, education and income towards the digital value
Kolmes (2012)	Social Media in the Future of Professional Psychology	Clinical practice	Websites and technology	Virtual gaming another critical development in recent times. Digital gaming era is pressing need to understand the people gaming preference's and habits affect behavior and design the educational gaming
Schnall *et al.* (2012)	The Immersive Virtual Environment of the digital full-dome: Considerations of relevant psychological processes	Virtual reality technology	Digital full-dome	However, the still much research is needed to explore the potential and benefits of the virtual environment. Virtual gaming another critical development in recent times. Digital gaming era is pressing need to understand the people gaming preference's and habits affect behavior and design the educational gaming
Manero *et al.* (2016)	An instrument to build a gamer clustering framework according to gaming preferences and habits	Secondary school students	Digital gaming	Evidence suggesting that attitudes towards gaming affect personal attitudes and behavior. The author also proposes applying the instrument to help designers of educational games better tailor their games to their target audiences
Schott and Hodgetts (2006)	Health and digital gaming – The benefits of a community of practice	Health education	Digital games	Digital games can promote positive and healthy activities in the health-related issues. Health consequence related to gaming can be searched by surgical training, health education and community participation
Rapp *et al.* (2003)	The impact of digital libraries on cognitive processes: psychological issues of hypermedia	Psychological issues of hypermedia	Digital libraries	Large scale databases construction of digital libraries is provided with the hypermedia search and examination tools. The impressive construction of a digital library is beneficial for the students and staff in multimedia
Takahashi and Tandoc (2016)	Media sources, credibility, and perceptions of science: Learning about how people learn about science	Media psychology	Scientific learning	The results of the study show that involvement in sciences directly predict knowledge and also has indirect effects on knowledge through its effects on Internet use, confidence in the press, and perception of scientists
Amichai-Hamburger *et al.* (2014)	The future of online therapy	Online therapy	Digital psychotherapy	Researchers are not limited to the digital libraries and online databases, but also research about the digital psychotherapy for the online patients and users exploited the other online resources, even to the online information gathering
Yang *et al.* (2015)	Virtual shopping and unconscious persuasion: The priming effects of avatar age and consumers' age discrimination on purchasing and prosocial behaviors	Prosocial behaviors	Digital goods	The study concluded that transforming digital goods has excellent potential and creating access for information and technology, reducing monetary costs and non-pecuniary costs such as transaction disutility, and reducing the impact of production on the environment

4.2 Psychological adaptation of digitalisation

The psychological shift towards digitisation is the basis for the second categorisation literature. The causes for and background development of the psychological shift towards digital mediums are discussed in the literature. Because of their psychological comfort, people find it challenging to shift using new technologies and mediums (Ellis *et al.*, 2013). However, the COVID-19 outbreak creates supply chain issues and products shortage on the shelves of supermarkets that will change consumers' psychological states. As most of the researchers earlier explain in the research about whether physical goods and digital goods value are not equal, the COVID-19 situation will be a more significant change into a psychological turn in the behaviour because of the social distancing and movement control (Shen *et al.*, 2020). However, the digital environment is gaining more relaxation as the research is related to the field's contributions. Economies and corporate cultures are moving gradually towards the digitalisation environment. So, the psychological behaviour of the people is developing step by step. The number of individuals using social networking sites is continuously rising, with some of them currently boasting millions of users. This shifted communication pathways and hinted at a psychological development pattern.

Digital behaviour is growing more common among young people than adultery over time, and young people account for most smartphone users and internet-connected gadgets. This also increases firms' psychological readiness to invest in digital products (Pulido *et al.*, 2018; Khan and Qureshi, 2020). According to Schnall *et al.* (2012), one of the latest development in the range of virtual environments has been the full digital dome. In addition, another notable advancement in recent years has been virtual gaming. The digital gaming age needs a better knowledge of how people's gaming preferences and habits impact their behaviour, as well as the creation of instructional gaming. Manero *et al.* (2016) tools have been recommended for application in psychology and behavioural sciences, as data demonstrates that gaming attitudes influence personal attitudes and behaviour. Table 2 shows the author, title, setting, procedures and findings of the psychological digitalisation.

However, a recent COVID-19 outbreak is creeping within the world very quickly, and some of the pat researchers about the SARS and MERS studies also shared that the pandemics usually shape societies' behaviours (Lee and Hsueh, 2020). During the SARS and MERS, deaths and infectious people were minimal and the psychological impacts of the Coronavirus were not too strong. However, the recent outbreak is more substantial, and the several infectious people are also very high (Brooks *et al.*, 2020). Recently, the outbreak moved many people into quarantine, and the psychological impacts are very different from the SARS and MERS. Social distancing and movements are limited to almost every part of the world, and digital devices are the only communication source (Rubin and Wessely, 2020). Smartphones and digital devices are more effective mediums in the outbreak situation, but some psychological issues are generated through these devices. Some fake and irrelevant news circulates among the users and consumers, increasing panic (Qureshi *et al.*, 2020b). However, digital channels may also aid in safety measures by communicating the precise circumstance and happenings. The digital era is required to develop and govern how the mental and psychological influence of customers and producers is maintained.

4.3 Behavioural changes

The psychological impact of a tragedy or pandemic outbreak influences behaviour. COVID-19 changed behaviours as a result of society's long history of infectious disease. Quarantine and social isolation are unpleasant experiences for society. Separation from loved ones, loss of freedom, uncertainty about health issues and boredom can all lead to serious repercussions (Brooks *et al.*, 2020). It is an excellent reason to believe that our behaviour changes how we

Table 2 Literature on psychological digitalisation

Author	*Title*	*Setting*	*Procedure*	*Findings*
Miller (2012)	The Smartphone Psychology Manifesto	Smartphones	Behavioral research	With the period importance and urgency of the phone will be move-in every part and subject. But a late study conducted on smartphones in the field of psychology
Piwek and Ellis (2016)	Can Programming Frameworks Bring Smartphones into the Mainstream of Psychological Science?	Smartphones	Psychological science	But enough applications are available that are used, a small number of researchers continue to explore the use of smartphones for collecting and validating psychological data, but this has not yet grown into the revolution of psychological and behavioral science research
Chamorro-Premuzic *et al.* (2016)	New Talent Signals: Shiny New Objects or a Brave New World?	Smartphone	Psychologists	Concluded in his study that it is essential to enhance new talent's ability to use digital technology and digitalisation tools. But, that also increases the rate of the psychology of opportunities and challenges
Peters *et al.* (2018)	Designing for Motivation, Engagement, and Wellbeing in Digital Experience	Human-computer interaction	Technology-supported behavior	Build this model based on existing evidence for essential psychological need satisfaction, including evidence within the context of the workplace, scientific knowledge production, computer games and health
Montag *et al.* (2016)	An Affective Neuroscience Framework for the Molecular Study of Internet Addiction	Health issue	Internet addiction	Classic research approaches from psychology considering personality variables as a vulnerability factor, especially in conjunction with neuroscience approaches such as brain imaging, have led to coherent theoretical conceptualizations of internet addiction
Annin and Scott (2013)	The homeless use Facebook? Similarities of social network use between college students and homeless young adults	Social network sites	Professional psychologists	The users of Facebook are giant in the world, and the thinking way also changes not only the communication and networking but also the businesses and corporate sectors have moved the Facebook
Lambert (2016)	Intimacy and social capital on Facebook: Beyond the psychological perspective	Social network sites	Psychological traits and depositions	The author suggests the term "intimacy capital" to conceptualize how these skills are distributed unevenly in society, opening a critical way of believing social capital and intimacy on Facebook
He and Bond (2013)	Word-of-mouth and the forecasting of consumption enjoyment	Word-of-mouth information	Hedonic stimuli	Changes the behavior and psychological perception of the customer. The study findings are elaborate on the ability of electronic word of mouth about the digital age
Guadagno *et al.* (2013)	The homeless use Facebook? Similarities of social network use between college students and homeless young adults	Homeless young adults	Psychology subject pool	It is mainly in types of Internet use and not access to the internet, and that divide is relatively minor
Huang and Park (2013)	Cultural influences on Facebook photographs	Environment	Social psychology	The study related to social psychology talks about social psychology indicates that East Asians from collectivistic and interdependent sociocultural systems are more sensitive to the contextual information than Westerners, whereas Westerners with individualistic and independent representation tend to process focal and discrete attributes of the environment

interact with others during challenging situations. On the other hand, technology is constantly changing people's lives, and psychologists have lately created some real methods for harnessing technology to provide psychological therapies (Yee and Bailenson, 2007). A study later discusses the importance of digital behaviour development in the virtual world. Technology is continuously redefining people's lives, and recently, psychologists have developed some concrete to harness technology to supply psychological interventions. According to Abel *et al.* (2021), age-related social primes can impact walking speed, product choice and prosocial behaviour. The impact of employing old and young internet shoppers' views and attitudes, product selection and prosocial behaviour. Without a doubt, e-commerce provides a rich setting for exploring the impacts of priming in many ways, and a greater knowledge of this theoretical process might yield critical insights for e-commerce (Ali *et al.*, 2021). However, some literature believes that online shopping cannot satisfy consumers' needs and wants.

Furthermore, when consumers are faced with shopping restrictions, they find and adopt newer ways to shop through technology. That is especially true when it comes to health and essential items (Su, 2007). Consumers purchasing products over the internet generally have incomplete information about the retailer's credibility and it makes the retailer's brand very important for those who care about the non-contractible aspects of after orders. However, building trust, especially in these extreme situations, means more than meeting expectations but exceeding them. It is still too early to tell how much consumer behaviour will change because of the COVID-19 pandemic (Di Crosta *et al.*, 2021). We will learn more and more about the immediate impact on stores and e-commerce as soon as additional countries move through the different stages and into restrictive living. Table 3 shows the author's findings, title, setting, procedures and behavioural changes. Figure 8 shows the possible future perspectives related to digital psychology.

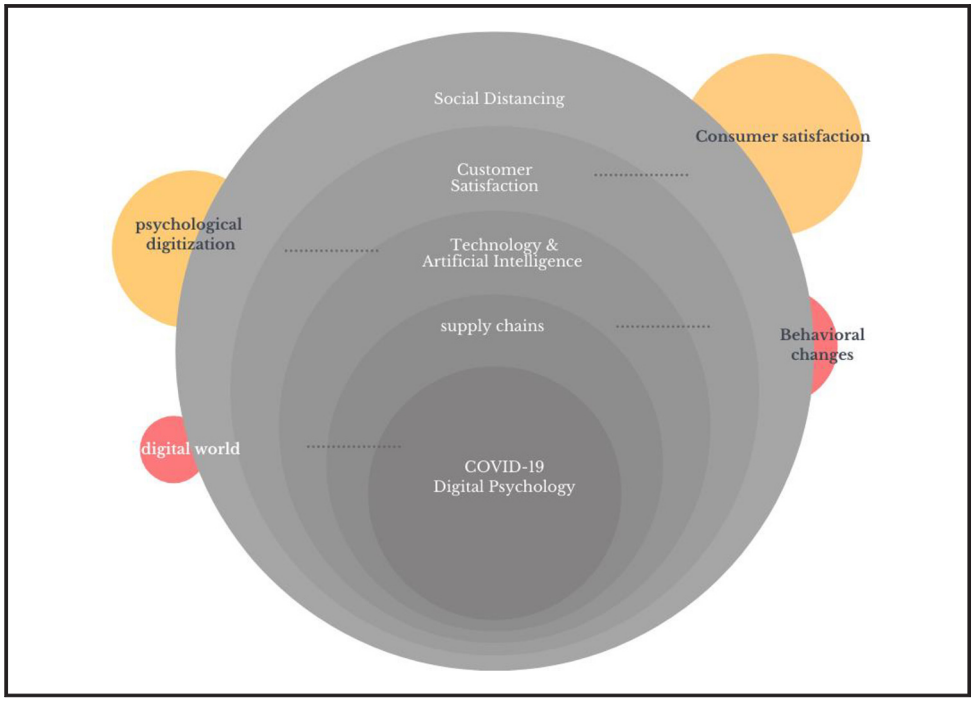
5. Results and discussion

The primary purpose of this research was to assess the impact of COVID-19 on consumer behaviour in terms of digital psychology when buying online products. Furthermore, the

Table 3 Literature on behavioural changes

Author	*Title*	*Setting*	*Procedure*	*Findings*
Yee and Bailenson (2007)	The Proteus Effect: The effect of transformed self-representation on behavior	Online games	Change the behavior	Virtual environments such as online games and chat rooms allow us to change the behavior according to the situation that can easily approach the environment. In later years, a study discusses the importance of digital behavior development in the virtual world
Schueller *et al.* (2013)	Realizing the Potential of Behavioural Intervention Technologies	Technology	Behavioral intervention	Behavioral intervention technologies only work for the behavioral and psychological strategies that use the technology for physical and mental health
Yoo *et al.* (2015)	Virtual shopping and unconscious persuasion: The priming effects of avatar age and consumers' age discrimination on purchasing and prosocial behaviors	Virtual shopping	Behavior	Social primes in the form of age can influence the walking speed behavior towards the product choice and prosocial behavior
Su (2007)	Consumer e-tailor choice strategies at online shopping comparison sites	Consumers purchasing products	Consumers purchasing products	Consumers purchasing products over the internet generally have incomplete information about the retailer's credibility. That makes the retailer's brand very important for those who care about the non-contractible aspects of after-orders

Figure 8 Digital psychology future in the post-COVID-19 world



present study will look at the causes of technology adaption behaviours and the evolution of digital psychological aims throughout the COVID-19 pandemic. The current study used the PRISMA statement 2020 to evaluate the records. The full inclusion and exclusion criteria were adopted to purify the form related to digital psychology and consumer behaviour modification during the COVID-19 pandemic. We identified 57 records for the data analysis, and VOS viewer software was used for the content analysis. This process was adopted to identify the significant data streams and classify literature based on critical terms occurrences. Three major data streams were identified, digital technologies, a psychological adaptation of digitalisation and behavioural changes. Based on the current study's findings, the agenda is formatted for future research on consumers' digital psychology (Qureshi *et al.*, 2019).

The COVID-19 outbreak posed a big challenge for science and the medical community in terms of creating vaccinations to prevent the virus and better options for consumers to satisfy their needs and preferences through a resilient supply chain (Lazzarini and Musacchio, 2020). More detailed research on consumer psychology in the digital arena is needed, as digital forums and online buying practices have evolved rapidly since COVID-19 (Hsieh, 2020). The supply chain and product shortage are recorded in the world's inferior parts and supermarkets and grocery stores in developed countries (Shaker *et al.*, 2020). Although the COVID-19 outbreak is more virulent in affluent nations, the number remains low in poor countries, except for Iran. However, to overcome the troubling circumstances when the future of social distance is unclear, supply chain procedures must be more effective (Wu and McGoogan, 2020).

In addition, the study included online shopping, video games, education, digital libraries, extensive home meal deliveries and digital devices literature areas from published records. However, it is witnessed that there needs to be more research available on the basics of daily routine supply chains. The main reason is that the consumers' freshness and physical products are valued more. Consumers cannot purchase digital products quickly because trust is a basic psychological difficulty (Strategies and Sheng, 2020). Nonetheless, in most

regions of the world, infrastructure availability may be improved. Also, the availability of internet services is a difficulty for consumers. Still, internet speed and accuracy are a question globally. Besides, underdeveloped countries still need to catch up in providing fast-speed internet, and prices are also very high, so consumers are not moving to use digital platforms (Andrew Petersen *et al.*, 2021).

6. Conclusion and future agenda

The study concludes with a look at the future of digital psychology, with consumer behaviour increasingly shifting to digital mediums. Furthermore, the data reveal that the world's future after COVID-19 is harder and more critical for mankind in terms of corporate, economic and social views. Businesses must transition to digital core-based software, data and supply chain operations that are fundamentally new operational architecture. This can help enterprises gain a competitive edge by lowering unit costs, increasing output and shifting away from digital platforms. However, to reduce human-to-human interaction and increase consumer digital trust, many new Artificial Intelligence technologies will be substituted with existing resources. Robots and drones, which are not suspicious of the virus, are being used to deliver packages. Furthermore, drone delivery is one of the safest and quickest ways to transport medical supplies where they need to go during a disease epidemic, and after the outbreak, drones may serve in enterprises and other public–private sector organisations.

7. Limitations

This research adds to the body of knowledge by developing a descriptive map of the current literature on digital psychological investigations. The research technique and classification process provide better mapping and understanding of the research. The article still has limitations after compiling the available literature and splitting it into the three main classes of digital psychology conducted. The reference literature used in this article comes from WoS- and Scopus-based journals with a strong reputation and excellent quality in their domains, making them highly representative. Almost every article on eligibility criteria includes methods and empirical results, whereas review papers do not provide empirical data or methodology but provide a comprehensive picture of the review in the area. Although the document mentions specific unfavourable reports and news on the 2019-COVID, these stories and reputable media have been subjected to in-depth scrutiny. Furthermore, while it is challenging to define psychology precisely, associated digital psychology research was picked to construct a SLR on the 2019-COVID future of socialising, economics and business.

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Further reading

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