Perceived risk factors assessment: during pandemic via digital buying

P. Nagesh and Sindu Bharath
Center for Management Studies, JSS Science and Technology University, Mysuru, India
T.S. Nanjundeswaraswamy
Department of Management Studies, JSS Academy of Technical Education, Bengaluru, India, and
S. Tejus
Center for Management Studies, JSS Science and Technology University, Mysuru, India

Received 22 July 2022
Revised 6 July 2023
27 October 2023
Accepted 23 November 2023

Abstract

Purpose – The present study is intended to assess the risk factors associated with digital buying. Also aims to design and develop an instrument to assess the digital buyers risk factor score (DBRFS) in light of pandemic.

Design/methodology/approach – Present investigation uses a quantitative approach to achieve the stated objectives. The survey instrument for the purpose of assessing risk factors associated with digital buying was developed in two phases. The present study adopts theory of planned behaviour (TPB), built based on the theory of reasoned action (TRA). The data were collected and analysed considering 500 valid responses, sampling unit being digital buyers using social media platforms in tyre-II city of India. The data collection was undertaken between June 2021 and August 2021. The instrument is designed and validated using exploratory factor analysis (EFA) followed by confirmatory factor analysis (CFA).

Findings – The present research identified six perceived risk factors that are associated with digital buying; contractual risk, social risk, psychological risk, perceived quality risk, financial risk and time risk. The DBRFS of male is 3.7585, while female is 3.7137. Thus, risk taking by the male and female is at par. For the age group 15–30, DBRFS is 3.6761, while age group 31–45 noted as 3.7889 and for the 46–50 age groups it is measured as 3.9649.

Practical implications – The marketers are expected to have the knowledge about how people responds to the pandemic. The outcome of the research helps to understand consumer behaviour but disentangling consumer's "black box" is challenging especially during global distress. The present study outcome helps the digital shopkeepers to respond positively to meet the needs of digital buying.

Originality/value – The scale development and to quantify the DBRFS. A deeper understanding of about digital consumers during pandemics will help digital shopkeepers to connect issues related digital buying.

Keywords Digital buying, Digital buyer behaviour, Perceived risk factors, Consumer behaviour, Pandemic

Paper type Research paper

The authors would like to express their gratitude to JSS Mahavidyapeetha, Mysuru, JSS Academy of Technical education, Bengaluru, Karnataka, India, and JSS Science and Technology University, Mysuru, Karnataka, India, for their encouragement to write this research paper. The authors express their sincere thanks to all the authors of source materials cited at the reference. They also express their sincere thanks to the editorial team for their valuable guidance and providing useful comments, observations and suggestions, which led to the improvement of this article.

Funding: No funding received.

PSU Research Review
Emerald Publishing Limited
e-ISSN: 2398-4007
p-ISSN: 2399-1747
DOI 10.1108/PRR-07-2022-0097

Introduction

The Internet and growth of technology across the world has changed the global business. Business operations started shifting away from traditional to advance digitalized processes. These digitalized processes gave a further boost to the e-commerce industry, making the digital environment more competitive. Despite the growing trend, there has always been a consumer market that is not involved in digital buying (Sajid *et al.*, 2022), and this gap is huge when it comes to consumers from emerging countries, specifically India. On contrary, prolonged lockdowns resulted in responses to the pandemic causing closures of several companies. However, it brought a new wave of online shopping all over the global market. Interestingly, when businesses went bankrupt and started the closure of their processes, the online market thrived and expanded by over 30–50%. This development brought drastic changes to the way consumers used to form their intention and behave toward digitalized solutions in pre COVID-19 times. Evidence shows that the global e-commerce industry has touched phenomenal growth during COVID-19. Digital platform (Dahiya and Gayatri, 2017) revolutionized the buying process (Snowaney and Chincholkar, 2019).

The digital marketing (DM) is a system of direct marketing that links digital buyer with seller electronically using collaborative technical platforms namely emails, websites, digital forums and newsgroups, television, mobile communication (Kotler and Armstrong, 2008). The coronavirus intensely transformed the global trends (Rana *et al.*, 2021). Due to the restrictions levied by respective governments during pandemic, digital buying has become imperative and order of the day (Ali *et al.*, 2021). The pandemic outbreak at the beginning of 2020 had changed the ways and perception of consumers buying, subsequently marketers found it challenging to understand the digital buying intensions and to provide digital services. It is noted that there are changes in behavioural pattern of digital buyers especially in COVID-19 pandemic. Purchase behaviours among social platform users are interesting and promising research topic.

A digital platform's characteristics can positively or negatively affect buyer's intentions. These changes attributes to perceived risk factors that are associated with digital buying. The unplanned changes influence the buying intention during pandemic. The distress of complete lockdown, limited supply and scarcity of necessary products which led to panic buying compelled the impulse buying patterns (Ahmed *et al.*, 2020). The health, safety concern, imposed restrictions, financial condition and other realities caused a notable change in digital buying behaviour (DBB) (Islam *et al.*, 2021). The effects of trust, customer ethnocentrism, service quality and perceived risk impacted customer loyalty in the COVID-19 pandemic. The DBB is influenced by factors like risk vulnerability, severity and risk of penalties. The marketers are expected to learn lessons from COVID-19 pandemic, knowledge about consumer responses towards digital buying (Fihartini *et al.*, 2021). It is required to report changes occurred during pandemic in information reliability, risk perception, attitudes about policy-making and communication with public with reference digital buying. Thus, the present study aims to assess perceived risk factors associated with DBB. Also attempts to quantify the perceived risk score of digital buying.

Sources on risk factors associated with digital buying

The influence of perceived usefulness, ease of use and risk factors towards digital buying matters a lot in making buying decision (Iriani and Andjarwati, 2020). The customers due to perceived risk of infections and ease of digital buying have considered to be major factors which have been examined to understand the change in DBB during the COVID-19 outbreak (Grashuis *et al.*, 2020; Alaimo *et al.*, 2021; Hadler *et al.*, 2021; Kim, 2021; Prasad and Srivastava, 2021; Truong *et al.*, 2022). Rashed Alhaimer (2022) investigates the various risk factors like risk-susceptibility, severity and formal penalties affecting DBB in Kuwait. In COVID-19 situation, as the pandemic progressed due to vaccine rollout and financial situations, the change in DBB is observed. Understanding these risk and other contributing factors is essential to predict the future of economy, especially business models for e-tailers (Nguyen *et al.*, 2021; Almajali *et al.*, 2021). It is better to understand these

changes in DBB and associated risk factors and its antecedents (Di Crosta *et al.*, 2021). The researchers (Nguyen *et al.*, 2021; Almajali *et al.*, 2021; Neger, 2020) look into issues of trust, perceived ease of use and perceived risk in other country context like Vietnam, Jordanian and Bangladesh during COVID-19.

The key factors of digital buying intention such as product delivery, cyber laws, shipping fees and communication lead to diverse behavioural changes. The intersection between COVID-19 risk factors and digital inequalities suggested to mitigate the risks associated with the pandemic (Robinson *et al.*, 2020).

There is a need to examine the role of perceived risk of digital purchase intention (Qalati *et al.*, 2021). The digital risk factors like product, delivery and information security risk affects digital buying during pandemic even in other countries, Im *et al.* (2021). The social-psychological reactance, people freedom, interaction, work place, performance, trust and security have an impact on DBB (Naeem Akhtar *et al.*, 2020). The antecedents associated with digital buying (hedonic motivation, satisfaction, perceived quality, financial policy, product features, information quality, economic situation and trust) which considerably influence DBB during the lockdown needs to be examined (Koch *et al.*, 2020; Al-Hattami, 2021). Gloster *et al.* (2020) revealed that there is a significant association between buying digitally before and after the appearance of the COVID-19. Nurunnabi *et al.* (2020) restated that prioritizing mental health, anxiety and coping strategies along with psychological effects is necessary as socio-psychological pressure is acute during pandemic. Adapting coping strategies which include problem-solving, social and emotional support to promote psychological well-being, Chinna *et al.* (2021). The pandemic results anxiety, sensitivity-related physical concerns and contamination leading to distress, Baloch *et al.* (2021).

Gu *et al.* (2021) proved that there is a need for understanding the speed of decision making by digital buying when purchasing goods and services online during pandemic. Valaskova *et al.* (2021) mentions that as a consequence of different restrictions in COVID-19 pandemic, digital buying and their shopping patterns have changed significantly; thus factors that influences new purchase patterns need to be identified to support retailers and marketers to develop appropriate strategies. Moon *et al.* (2021) states that pandemic has caused chaos since the end of 2019 and hence there is a need to study the aspects of digital buying' shopping. Islam *et al.* (2021) mention that pandemic has triggered substantial modifications in the habits of digital buying all over the world which led to key changes among digital buying. Given the pandemic and safety concerns, customers have considered various options for shopping (Grashuis *et al.*, 2020; Alaimo *et al.*, 2021; Hadler *et al.*, 2021; Kim, 2021). As the pandemic progressed, shopping behaviour continued to change depending on possible factors related to COVID-19 situation, vaccine rollout and financial situations. Understanding these contributing factors is essential to predict the future of our economy, especially business models for retailers. The literature remains silent to explore relationship between perceived risk factors associated with digital buying although there is rapid upsurge in digital shopping.

Psychological impact such as seeking social support and acceptance coping strategies were significantly associated with the level of anxiety that prevailed during pandemic, Kamaludin *et al.* (2020). In addition, due to the risk of infection and possible death also exerts tremendous anxiety level pressure among university students, Khoshaim *et al.* (2020). The digital technology and psychological artificial intelligence solutions shall be implemented to manage anxiety levels of students, Sundarasen *et al.* (2020). The critical risk features of digital buying was examined considering 322 responses adopting an instrument consisting of 5 items with 5 factors, Sangameshwara *et al.* (2022) which needs to be studied further to confirm and validate the risk factors.

Given this background, the above mentioned literature provides the evidence on influence of pandemic across globe however; the present study is intended to assess the risk factors

that affects DBB in tyre-II city of India. Therefore, present research aims to design and develop an instrument to assess the perceived risk of digital buyer's in light of pandemic and to quantity the digital buyers risk factor score (DBRFS).

Theoretical foundation for the study

The present study adopts the well proved theory on the consumer behaviour to study the digital buying during the pandemic situation. The variables considered for the current study is based on theory of planned behaviour (TPB), built based on the theory of reasoned action (TRA) (Ramus and Asger Nielsen, 2005). TPB helps to predict an individual's intention (considering the risk factors associated with DBB) to engage in a behaviour (buying) at a specific time (pandemic) and place (Tier II city). The researchers have considered the above underpinning theory and framework while selecting the risk variables for the present study.

Research question

RQ1. What are the perceived risk factors associated with digital buying during pandemic?

RQ2. How to quantity digital buyers risk factor (DBRF) in light of pandemic?

Research objective

The purpose of this study is to analyse the perceived risk factors associated with DBB and to ascertain the risk factor score (DBRFS) in light of pandemic in tyre-II city of India.

Methodology

Present investigation uses a quantitative approach to achieve the stated objectives. The survey instrument for the purpose of assessing risk factors associated with DBB was developed in two phases as detailed below;

Phase 1 – initial instrument development and field test

Instrument development

Survey instrument for the purpose of assessing perceived risk factors associated with digital buying was developed in phase 1 which is keen on developing questions to obtain feedback. Precaution was taken to evade ambiguity and double-barrelled questions. The initial instrument was shared with limited group of digital buyers through a convenience sample to obtain feedback. Further, five-point Likert-scale is used for the survey ("Strongly Disagree" to "Strongly Agree statements"). The data were gathered during second wave of COVID-19 pandemic in tier-II city of Karnataka State, India between June–August 2021. The instrument consists 46 items of five drivers (to enhance the credibility of the designed instrument, minimum of five items were included for each driver. The preliminary instrument development and field test was conducted with 150 respondents via email survey. The exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) are used to validate the instrument using statistical package for the social sciences (SPSS) software and through analysis of moment structures (AMOS). The model fitness is verified.

Data analysis

The collected data were examined for any outliers and other irregularities. The CFA is adopted to examine the structure that is proposed. The objective of adopting CFA was to examine the relationship among the latent and manifest variables. The goodness-of-fit indexes are considered to evaluate proposed CFA. This investigation used the ratio of chi-square fit

statistics/degree of freedom (CMIN/DF) = 2.528, which shall be within the threshold value of 5 (Hair *et al.*, 1998). The other fit indices include, goodness-of-fit index (GFI), adjusted goodness of fit index (AGFI), incremental fix index (IFI), Tucker–Lewis index (TLI), normed fix index (NFI) and comparative fix index (CFI) which are expected to be closer to unity, an indication of effective model fitness (Bentler, 1992) and error approximation value root mean square error of approximation (RMSEA) shall be less than 0.09, which is within the acceptable range (Hair *et al.*, 2006). The TLI nearer to unity indicates that there is a strong relationship between covariance and variance (Schreiber *et al.*, 2006) and TLI value greater than 0.90 shows acceptable model fitness (Hu and Bentler, 1999).

Results

The results of initial analysis (phase-1) CFA shows that the model proposed does not exhibit goodness-of-fit (CMIN/Df is 2.528; TLI 0.582; RMSEA 0.101). As the model found to confirm poor-fit, the proposed model in phase-1 is not detailed. Thus, it was desired to evaluate possible alternate structures of the data.

To attain this, EFA was used. The EFA helps to explore underlying factors without compelling a preconceived structure (Child, 1990). This six-factor model which includes risk factors like contractual risk (CR), financial risk (FR), psychological risk (PR), perceived quality risk (PQR), social risk (SR) and time risk (TR). As the six-factor model appeared to be promising, it was deemed essential to further investigate and test the model with a larger sample.

Phase 2 – refined instrument and field test

Instrument refinement

The output of phase 1 model (Six-factor) was considered as a base for updating the instrument. Further, at this stage 3 items included in the original sub-scale titled feedback in social media, advertisement in digital media, compute or mobile skills for digital buying were removed. The supplementary items were constructed to update the framework that was theorized. The revised questionnaire has 25 statements (see Table 3). Instrument is constructed using five-point Likert scale. To enhance the credibility of the designed instrument, minimum of five items were included for each driver. The instrument development and field test was conducted with 500 respondents. The EFA and CFA are used to validate the instrument using SPSS software, and through AMOS and model fitness is verified.

Data analysis

The KMO value is 0.827, indicates that the sample size is sufficient (Kaiser and Rice, 1974). Barlett's test of sphericity was hypothesised to know the relationship (strength) amongst grouped items. A small significance (less than 0.05) indicate that the data is suitable to conduct CFA (Tobias and Carlson, 1969), test results show that the p-value is less than 0.05, indicating that data is suitable to conduct EFA. To identify risk factors that influences on digital buying, to reduce the number of components and items, EFA was conducted using Varimax rotation method using principal component analysis (PCA) followed by CFA. The results are discussed in below section and tabulated in Table 1.

Based on the Eigen value in EFA six factors were extracted whose Eigen value is more than one and based on the relevance grouped factors were tilted as: Contractual Risk (CR); Financial Risk (FR); Psychological Risk (PR); Perceived Quality Risk (PQR); Social Risk (SR) and Time Risk (TR), items loading more than 0.5 were consider for the better model fit Stewart (1981). For the present study, the item loading ranges from 0.540 to 0.911, it is represented in below Table 2.

Component	Initial eigenvalues Total	% of variance	Cumulative %	Extraction sums of squared loadings Total	% of variance	Cumulative %	Rotation sums of squared loadings Total	% of variance	Cumulative %
1	5.432	23.618	23.618	5.432	23.618	23.618	3.407	14.814	14.814
2	3.834	16.669	40.287	3.834	16.669	40.287	3.373	14.665	29.479
3	2.488	10.819	51.106	2.488	10.819	51.106	2.644	11.494	40.973
4	1.624	7.062	58.168	1.624	7.062	58.168	2.385	10.369	51.341
5	1.530	6.652	64.820	1.530	6.652	64.820	2.361	10.265	61.607
6	1.421	6.180	70.999	1.421	6.180	70.999	2.160	9.393	70.999
7	0.824	3.583	74.582						
8	0.638	2.772	77.354						
9	0.625	2.716	80.070						
10	0.550	2.392	82.462						
11	0.517	2.247	84.709						
12	0.470	2.045	86.754						
13	0.422	1.837	88.590						
14	0.389	1.692	90.282						
15	0.375	1.629	91.911						
16	0.310	1.347	93.259						
17	0.277	1.206	94.464						
18	0.259	1.124	95.589						
19	0.242	1.051	96.640						
20	0.212	0.923	97.562						
21	0.200	0.870	98.432						
22	0.197	0.856	99.288						
23	0.164	0.712	100.000						

Note(s): Extraction method: principal component analysis
Source(s): Table created by authors

Table 1. Total variance explained

Confirmatory factor analysis (CFA)

To verify the extracted six factors along with 24 items, CFA was carried out using SPSS and AMOS software. In the CFA analysis all, the six factors along with 24 items were confirmed.

Followings are the six confirmed factors

(1) Contractual Risk (CR)

(2) Financial Risk (FR)

(3) Psychological Risk (PR)

(4) Perceived Quality Risk (PQR)

(5) Social Risk (SR)

(6) Time Risk (TR)

The proposed digital marketing risk factor measurement model has adequate model fitness; it is represented in Figure 1. According to Bentler (1992) and Bentler and Bonett (1987) all the fit index should be nearer to unity, error factors should be less than 0.08 and CMIN/DF should be less than 3 for the better measurement model. The proposed fit indices are CMIN/DF = 2.334, within the threshold value of 5 (Hair *et al.*, 1998). The other fit indices include, GFI = 0.893, AGFI = 0.859, IFI = 0.932, TLI = 0.917, NFI = 0.887 and CFI = 0.954 are very close to unity,

	Component					
	1	2	3	4	5	6
CR1	0.810					
CR2	0.802					
CR3	0.795					
CR4	0.753					
CR5	0.627					
FR1		0.911				
FR2		0.907				
FR3		0.893				
FR4		0.876				
PR1			0.824			
PR2			0.813			
PR3			0.750			
PR4			0.578			
PR5			0.540			
PQR1				0.838		
PQR2				0.816		
PQR3				0.811		
SR1					0.852	
SR2					0.848	
SR3					0.807	
TR1						0.832
TR2						0.780
TR3						0.772

Note(s): Extraction method: principal component analysis
Rotation method: varimax with Kaiser normalization
a. Rotation converged in 5 iterations
Source(s): Table created by authors

Table 2.
Rotated component matrix

which is an indication of effective model fitness (Bentler, 1992) and error approximation value RMSEA is 0.062, which is within the acceptable range (Hair *et al.*, 2006). The outcome of the CFA model is represented in Figure 1. The dimensions of the perceived risk factors associated with digital buying were identified as: contractual, financial, psychological, perceived quality, Social Risk and Time Risk. Thus, revised CFA with larger sample (n = 500) was considered to understand perceived risk factors associated with digital buying during the pandemic. The constructs and dimensions of risk factors is presented in Table 3 below.

The below section details the perceived risk factors associated with digital buying.

Contractual Risk-Taking account of the socioeconomic characteristics, technical characteristics of the commodity and the institutional environment are part of contractual arrangements in buyer/seller relationship. The enforcement of consumer rights through contractual agreement is vital for digital business. The digital brand trust and contractual risk are an antecedent to digital buying (Katrodia *et al.*, 2018). The performance and contractual risk, trust and security have a significant impact on digital buying (Shahzad, 2015).

Financial Risk – The fear for loss of money, non-delivery and improper return-policy have depressing effect (Georgie, 2021). The FR has a negative effect on the intention to buy (Shahri Mejarshin *et al.*, 2021).

Psychological Risk- The threat of health crisis, scarcity of products, fear of unknown, negative emotions and uncertainty leads to PR, Wu *et al.* (2020).

Perceived Quality Risk- The purchase intention was influenced by perceived quality and brand trust (Taufik *et al.*, 2021). The seven quality dimensions are: reliability, accessibility,

Constructs	Statements	References
Financial factor	Chances of misuse of credit/debit card information Cost being deducted but order not placed The financial details might not be protected Refund initiated by the supplier but not credited Unauthorised charges on returns/taxes/ transportation Disclosure about price of product may be misleading	Rana *et al.* (2021), Cecianti and Hati (2021), Guru *et al.* (2020), Ariff *et al.* (2014, June), Johnson and Ramirez (2020),Georgie (2021), Gabrielli *et al.* (2022), Daroch *et al.* (2021), Keating *et al.* (2009), Mahmood *et al.* (2021), Makhitha and Ngobeni (2021), Fihartini *et al.* (2021), Lissitsa and Kol (2021), Shahri Mejarshin *et al.* (2021), Masud *et al.* (2022)
Contractual factor	Risk of guarantee/warrantee claim is confusing Risk of fulfilment of Warrantee/guarantee conditions Risk of return/replacement of products in case of product failure Risk of after sales service/maintenance work Risk of reselling the product	Kariyawasam and Guy (2008), Teo and Yu (2005), Soni and Verghese (2018), Dorward (2001), Grabner-Kraeuter (2002), Sreya and Raveendran (2016), Shahzad (2015), Bhatti *et al.* (2019), Korgaonkar and Karson (2007)
Psychological factor	Digital buying reveals individual's social presence Acceptance of products/services brought digital by their friends Concerned about possible loss of status social group Digital shopping affects the image of people around	Rasty *et al.* (2021), Ko *et al.* (2004), Brewer and Sebby (2021), Pentz *et al.* (2020), Lăzăroiu *et al.* (2020),Wu *et al.* (2020), Marceda Bach *et al.* (2020), Challet-Bouju *et al.* (2020),Yuen *et al.* (2020)
Time risk factor	Waste of time if product does not meet expectation Waste of time if product delivered is damaged Selecting the right product is time consuming Risk of receiving wrong product	Guru *et al.* (2020), Pham *et al.* (2020), Reddy *et al.* (2020), Ivanović-Đukić *et al.* (2020), Robinson *et al.* (2020), Saini (2022), Cho *et al.* (2010), Otika *et al.* (2019), Wai *et al.* (2019), Ofori *et al.* (2019)
Social factor	Continuous reminders via social media on promotional/offers affects consumer psychology Consumers feel buying digital reflects self-esteem The digital buying leads to social isolation	Yahaya *et al.* (2021), Singh *et al.* (2021), Amirtha *et al.* (2022), Bhatti *et al.* (2019), Maziriri *et al.* (2017), Han *et al.* (2016), Pauzi *et al.* (2017), Park and Tussyadiah (2017)
Perceived quality factor	The quality of web portal is not adequate The quality of product and images are misleading Digital buying process does not finish one shot as	Qalati *et al.* (2021), Ali *et al.* (2021), Sebastianelli *et al.* (2008), Mathur *et al.* (2021), Djakasaputra *et al.* (2021), Nguyen *et al.* (2021), Taufik *et al.* (2021), Ryu and Ko (2020), Lim (2020), Vancic *et al.* (2020)

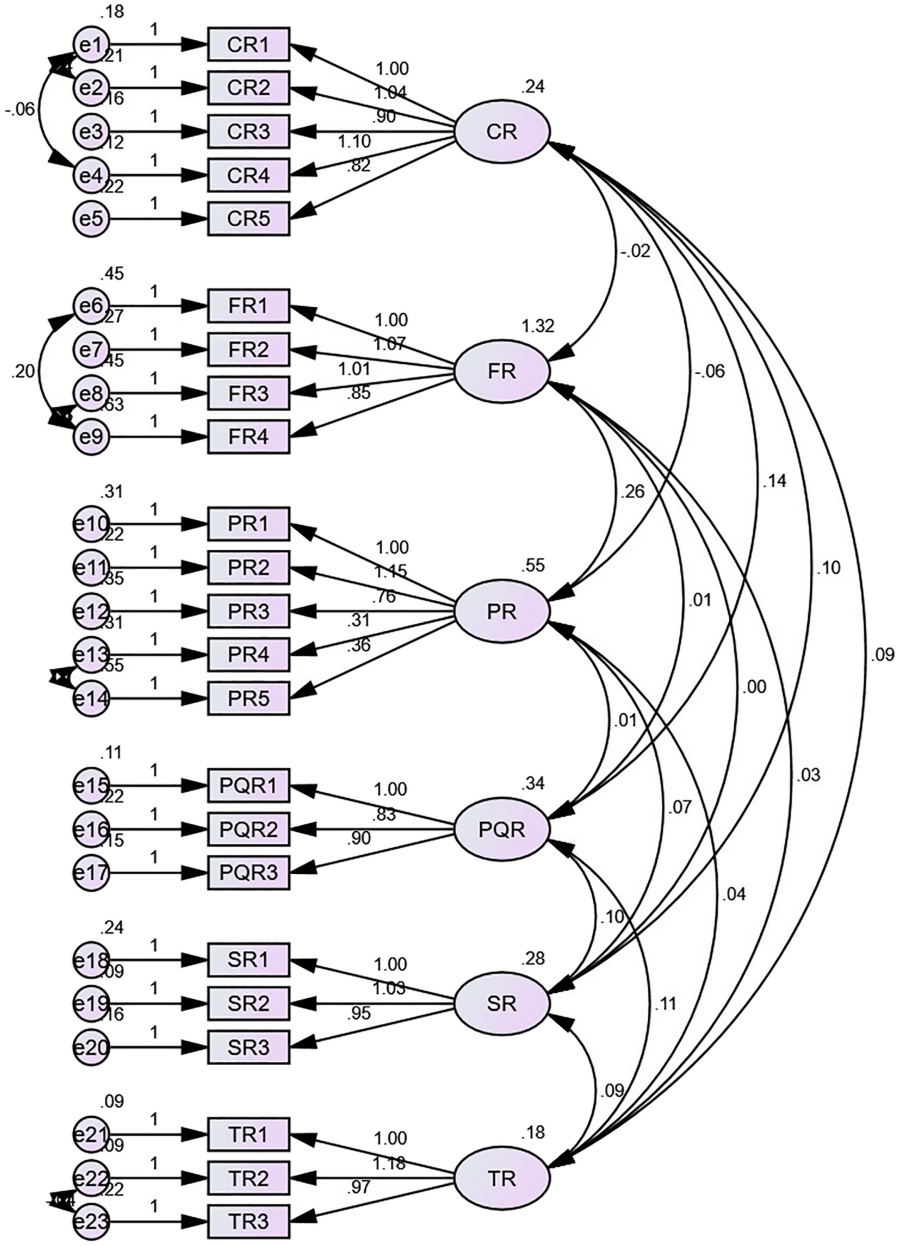
Source(s): Table created by authors

Table 3. Dimensions of risk factors associated with digital buying

ordering services, convenience, product content, assurance and credibility (Sebastianelli *et al.*, 2008).

Social Risk factors- Attitude, subjective norms, scarcity, healthy habit of social media use, strong social ties positively influence customers' panic buying intention during COVID-19 pandemic.

Time Risk- TR- Include spend more time and effort to make decisions. Also leads delay in getting the product.



Source(s): Figure created by authors

Figure 1.
Measurement model for identifying risk factors in digital buying

Assessment of risk factor score for digital buyers

Predictive model: regression analysis

To assess the DBRFS, an attempt is made to develop the linear regression equation to estimate the score based on factors confirmed by second order CFA; CR, PR, FR, PQR, SR and TR. The findings and analysis is mentioned in below section in the form of equation. $Y = a + ß1 * X1 + ß2 * X2 + ß3 * X3 + ß4 * X4 + ß5 * X5 + e_i$

Thus, by substituting coefficients of dependent variables, DBRFS may be obtained. The respondents were classified based on the demographic factors (age and gender). The model summary of the identified six factor regression model is mentioned Table 4.

Table 5 shows the analysis of variance (ANOVA) test statistics for the proposed six factor model, the significance level of the proposed model is 0.000, it clearly shows that none of the proposed six factors coefficient of regression is zero, that is non-zero correlation between the six factors.

Table 6 shows the regression coefficient and standardized coefficients for the proposed six factors regression model.

By substituting independent variable's mean value in the regression equation, as per descriptive statistics Table 4, DBRFS can be obtaining.

Model	R	*R* square	Adjusted *R* square	Std. error of the estimate
1	0.865a	0.748	0.743	0.32808

Note(s): a. Predictors: (Constant), TR, FR, PR, SR, PQR, CR
Source(s): Table created by authors

Table 4. Model summary

Model		Sum of squares	df	Mean square	F	Sig
1	Regression	107.869	6	17.978	167.028	0.000b
	Residual	36.381	338	0.108		
	Total	144.249	344			

Note(s): a. Dependent variable: risk factor (RF)
b. Predictors: (constant), TR, FR, PR, SR, PQR, CR
Source(s): Table created by authors

Table 5. ANOVA statistics

Model		Unstandardized coefficients		Standardized coefficients		
		B	Std. Error	Beta	t	Sig
1	(Constant)	−0.046	0.203		−0.224	0.823
	CR	0.115	0.041	0.090	2.787	0.006
	FR	0.001	0.015	0.002	0.054	0.957
	PR	−0.044	0.031	−0.041	−1.408	0.160
	PQR	−0.057	0.035	−0.050	−1.605	0.109
	SR	0.929	0.034	0.832	27.728	0.000
	TR	0.085	0.042	0.064	2.031	0.043

Note(s): a. Dependent variable: SR3
Source(s): Table created by authors

Table 6. Regression coefficients

$$\text{DBRFS} = -0.045 + 0.114 * 4.0487 + 0.0006 * 2.8812 - 0.0437 * 3.6707$$
$$- 0.0570 * 3.8696 + 0.930 * 3.7179 + 0.0848 * 3.9807$$
$$\text{DBRFS} = 3.8325.$$

Therefore, overall risk factor associated with digital buyers is 3.8325. From this it is shows that for the five points scale the risk factor score is 3.8325, that is risk factor in digital buying for the respondents are 76.65%.

Relationship between components of risk factor

To verify the magnitude and direction of the association among the components of risk factor in digital buying, Pearson correlation analysis was conducted, correlation coefficient (r) among components is represented in Table 7.

Pearson correlation analysis shows that there is a strong (r = 0.429) correlation among PQR and CR. There is a less (r = 0.014) correlation between PQR and FR.

The Risk Factor Score of male is 3.7585, while the same with female is 3.7137, thus, risk taking by the male and female is at par, it is represented in Table 8. In case of age wise analysis, for the age group 15–30 DBRFS is 3.6761, while for the age group 31–45 it is 3.7889 and in case of age group 46–50 it measures as 3.9649. Thus, it may be interpreted as the risk taking by the age group 15–30 is lesser than the age group 31–45 but 46–60 is comparatively higher during the pandemic, it is represented in Table 9.

Discussion and conclusions

The present research uses digital platforms including Facebook, Twitter, Linked-In and YouTube and Instagram for the study which in line with other researchers (Dwivedi *et al.*, 2021; Chopra *et al.*, 2021; Chaudhary *et al.*, 2021). The digital marketers have to understand the DBB and decision making pattern. Since digital marketing emerged, there has been a huge transformation

Factors of risk	CR	FR	PR	PQR	SR	TR
CR	1					
FR	−0.025	1				
PR	−0.014	0.238	1			
PQR	0.429	0.014	0.0892	1		
SR	0.302	−0.009	0.1961	0.2673	1	
TR	0.409	0.071	0.1430	0.3552	0.2983	1

Source(s): Table created by authors

Table 7. Correlation among components of risk factor

No	Gender	Linear regression equation	DBRF score
1	Male	DBRF = −0.045 + 0.114 CR + 0.0006 FR −0.0437 PR −0.0570 PQR + 0.930 SR + 0.0848 TR	3.7585
2	Female	DBRF = −0.045 + 0.114 CR + 0.0006 FR −0.0437 PR −0.0570 PQR + 0.930 SR + 0.0848 TR	3.7137

Source(s): Table created by authors

Table 8. DBRFS computation (gender wise)

in the marketing process especially during pandemic due to distress (lockdown, threat of the health crisis, product scarcity, fear and negative emotions and panic buying) which compelled traditional buyers to opt digital buying. This new trend in marketing has provided equal opportunities to businesses irrespective of size, challenges and complexity in which digital marketers have to operate. However, risk associated with digital shopping needs consideration.

The present research identified six perceived risk factors that are associated with digital buying during pandemic; CR, FR, PR, PQR, SR and TR which affects digital buying. Sreya and Raveendran (2016) also reconnoitred the same along with physical and performance risk. The present study also identifies that CR is an important risk factor. The various factors associated with CR are perceived transaction cost, uncertainty, dependability of digital stores, frequency, buyer-seller relationships, socio-economic characteristics of each party, economic and institutional environment.

As identified by present research, FR negatively affects the digital buying intention which was echoed by (Katrodia *et al.*, 2018; Rana *et al.*, 2021). The product and non-delivery risks negatively affect the intention of digital buyers. The perceptions of service quality and relationship-marketing are important factors in digital retail environment. From the above discussion, initiation was to be made by e-commerce companies to mitigate critical risk factors such as performance risk and FR (Guru *et al.*, 2020).

The outcome of the present study was also prevalent among Korean and US buyers (Ko *et al.*, 2004). The psychological and SRs were affects digital buying of South African consumers (Pentz *et al.*, 2020). Yuen (2020) observed phenomenon of panic buying due to the fear of illness, empty shelves, price increase, social inclination, threat of the health crisis, product scarcity, fear and negative emotions in Singapore which was also witnessed in our study context. The association of consumer-perceived quality and purchase intention influences digital buying (Qalati *et al.*, 2021), however, SR is found to be one of the factors from the present research that affects the digital buying. Saini *et al.* (2022) acknowledged the significance of product risk and privacy risk during the COVID-19 along with the present study findings. It is desirable to quantify risk factors associated with digital buying.

DBRFS in light of pandemic. The multiple regression equation is used to measure DBRFS. The DBRFS is measured (age and gender wise). The risk factor Score of male is 3.7585, while female is 3.7137, thus, risk taking by the male and female is at par. In case of age wise analysis, for the age group 15–30 DBRFS is 3.6761, while age group 31–45 it is 3.7889 and in case of age group 46–50 it measures as 3.9649. Thus, it may be interpreted as the risk taking by the age group 15–30 is lesser than the age group 31–45 but 46–60 is comparatively higher during the pandemic. Thus the present research findings conclude that during pandemic irrespective of gender there are no significant differences towards risk taking ability of digital buyers due to the distress caused by pandemic.

Table 9.
Risk factor score (RFS) computation (age wise)

No	Age group	Linear regression equation	DBRFS
1	15–30	DBRF = −0.045 + 0.114 CR + 0.0006 FR −0.0437 PR −0.0570 PQR + 0.930 SR + 0.0848 TR	3.6761
2	31–45	DBRF = −0.045 + 0.114 CR + 0.0006 FR −0.0437 PR −0.0570 PQR + 0.930 SR + 0.0848 TR	3.7889
3	46–60	DBRF = −0.045 + 0.114 CR + 0.0006 FR −0.0437 PR −0.0570 PQR + 0.930 SR + 0.0848 TR	3.9649

Source(s): Table created by authors

Practical implication

The study has important theoretical and managerial implications for improving digital buyer's decision model. Firstly, market researchers have been trying for decades to understand consumer behaviour but disentangling consumer's "black box" is challenging especially during global distress, our study provides further evidence on the consumer decision model for the understanding of consumer behaviour in the digital marketplace with special attention on risk associated with digital buying. Secondly, we suggest digital shopkeepers to identify the presence of their product/services in multiple social media platforms to find greater opportunity to engage with customers and showcase their brand. With more than 2 billion users worldwide, Social platforms are a perfect communication tool for sellers to convey their value to buyers and actively respond to buyers' needs and enquiries. Thirdly, digital sellers could participate in commercial communities that are regulated and trusted by community members, conducting social interactions with members so that they develop trust with sellers through continuous interactions, these members feel less exposed to risk.

Limitation and scope for further research

The present study is mainly focused on risk factors because it is imperative for social platforms wishing to monetize through s(social)-commerce to reduce risk. However, the study can be extended to other influential factors, such as merchandising approaches and online group buying. Detailed studies may be conducted to reveal key push and pull factors surrounding the use of the internet for search activities using updating technologies to facilitate purchase behaviours (cloud-based shopping apps and artificial intelligence (AI)-driven chatbots).

References

Ahmed, R.R., Streimikiene, D., Rolle, J.-A. and Duc, P.A. (2020), "The COVID-19 pandemic and the antecedants for the impulse buying behavior of US citizens", *Journal of Competitiveness*, Vol. 12 No. 3, pp. 5-27, doi: 10.7441/joc.2020.03.01.

Al-Hattami, H.M. (2021), "Determinants of intention to continue usage of online shopping under a pandemic: COVID-19", *Cogent Business and Management*, Vol. 8 No. 1, 1936368, doi: 10.1080/23311975.2021.1936368.

Alaimo, L.S., Fiore, M. and Galati, A. (2021), "Measuring consumers' level of satisfaction for online food shopping during COVID-19 in Italy using POSETs", *Socio-Economic Planning Sciences*, Vol. 82 April, pp. 1-15, doi: 10.1016/j.seps.2021.101064Link.

Ali, A., Narongsak (Tek), T. and Ashraf, A.R. (2021), "Strategic imperatives of mobile commerce in developing countries: the influence of consumer innovativeness, ubiquity, perceived value, risk, and cost on usage", *Journal of Strategic Marketing*, Vol. 29 No. 8, pp. 722-742, doi: 10.1080/0965254X.2020.1786847.

Almajali, D.A. and Hammouri, Q. (2021), "Predictors of online shopping during covid-19 pandemic in developing country: qualitative analysis", *Annals of the Romanian Society for Cell Biology*, Vol. 25 No. 6, pp. 12970-12977, available at: https://www.annalsofrscb.ro/index.php/journal/article/view/8082

Amirtha, R. and Sivakumar, V.J. (2022), "Building loyalty through perceived value in online shopping–does family life cycle stage matter?", *The Service Industries Journal*, Vol. 42 Nos 15-16, pp. 1151-1189, doi: 10.1080/02642069.2021.1960982.

Ariff, M.S.M., Sylvester, M., Zakuan, N., Ismail, K. and Ali, K.M. (2014), "Consumer perceived risk, attitude and online shopping behaviour; empirical evidence from Malaysia", *IOP Conference Series: Materials Science and Engineering*, IOP Publishing, Vol. 58 No. 1, 012007, doi: 10.1088/1757-899X/58/1/012007.

Baloch, G.M., Sundarasen, S., Chinna, K., Nurunnabi, M., Kamaludin, K., Khoshaim, H.B. and AlSukayt, A. (2021), "COVID-19: exploring impacts of the pandemic and lockdown on mental health of Pakistani students", *Peer-reviewed journal*, Vol. 9, e10612, doi: 10.7717/peerj.10612, available at: https://peerj.com/articles/10612/

Bentler, P.M. (1992), "On the fit of models to covariances and methodology to the Bulletin", *Psychological Bulletin*, Vol. 112 No. 3, pp. 400-404, doi: 10.1037/0033-2909.112.3.400.

Bentler, P.M. and Bonett, D.G. (1987), "This week's citation classic", *Current Contents, Social and Behavioral Sciences*, Vol. 19, p. 16.

Bhatti, M.A., Hussain, M.S. and Al Doghan, M.A. (2019), "The role of personal and job resources in boosting nurses' work engagement and performance", *Global Business and Organizational Excellence*, Vol. 37 No. 2, pp. 32-40, doi: 10.1002/joe.21840.

Brewer, P. and Sebby, A.G. (2021), "The effect of online restaurant menus on consumers' purchase intentions during the COVID-19 pandemic", *International Journal of Hospitality Management*, Vol. 94, 102777, doi: 10.1016/j.ijhm.2020.102777.

Cecianti, V.P. and Hati, S.H. (2021), "Factors affecting online impulse buying on social commerce in Indonesia: the moderation role of perceived financial risk", in *Contemporary Research on Business and Management*, CRC Press, pp. 237-240, doi: 10.1201/9781003196013.

Challet-Bouju, G., Grall-Bronnec, M., Saillard, A., Leboucher, J., Donnio, Y., Péré, M. and Caillon, J. (2020), "Impact of wagering inducements on the gambling behaviors, cognitions, and emotions of online gamblers: a randomized controlled study", *Frontiers in Psychiatry*, Vol. 11, 593789, doi: 10.3389/fpsyt.2020.593789.

Chaudhary, S., Dhir, A., Ferraris, A. and Bertoldi, B. (2021), "Trust and reputation in family businesses: a systematic literature review of past achievements and future promises", *Journal of Business Research*, Vol. 137, pp. 143-161, doi: 10.1016/j.jbusres.2021.07.052.

Child, D. (1990), *The Essentials of Factor Analysis*, 2nd ed., Cassel Educational, London.

Chinna, K., Sundarasen, S., Khoshaim, H.B., Kamaludin, K., Nurunnabi, M., Baloch, G.M., Memon, Z., Sukayt, A., Dalina, N., Rajagopalan, U. and Kumar, R. (2021), "Psychological impact of COVID-19 and lock down measures: an online cross-sectional multicounty study on Asian university students", *PloS One*, Vol. 16 No. 8, e0253059, doi: 10.1371/journal.pone.0253059.

Cho, J.Y., Han, H.S., Yoon, Y.S. and Ahn, K.S. (2010), "Risk factors for acute cholecystitis and a complicated clinical course in patients with symptomatic cholelithiasis", *Archives of Surgery*, Vol. 145 No. 4, pp. 329-333, doi: 10.1001/archsurg.2010.35.

Chopra, A., Avhad, V. and Jaju, A.S. (2021), "Influencer marketing: an exploratory study to identify antecedents of consumer behavior of millennial", *Business Perspectives and Research*, Vol. 9 No. 1, pp. 77-91, doi: 10.1177/22785337209234.

Dahiya, R. and Gayatri (2017), "Investigating Indian car buyers' decision to use digital marketing communication: an empirical application of decomposed TPB", *Vision*, Vol. 21 No. 4, pp. 385-396, doi: 10.1177/0972262917733175.

Daroch, B., Nagrath, G. and Gupta, A. (2021), "A study on factors limiting online shopping behaviour of consumers", *Rajagiri Management Journal*, Vol. 15 No. 1, pp. 39-52, doi: 10.1108/RAMJ-07-2020-0038.

Di Crosta, A., Ceccato, I., Marchetti, D., La Malva, P., Maiella, R., Cannito, L., Cipi, M., Mammarella, N., Palumbo, R., Verrocchio, M.C., Palumbo, R. and Di Domenico, A. (2021), "Psychological factors and consumer behavior during the COVID-19 pandemic", *PloS One*, Vol. 16 No. 8, e0256095, doi: 10.1371/journal.pone.0256095.

Djakasaputra, A., Wijaya, O., Utama, A., Yohana, C., Romadhoni, B. and Fahlevi, M. (2021), "Empirical study of Indonesian SMEs sales performance in digital era: the role of quality service and digital marketing", *International Journal of Data and Network Science*, Vol. 5 No. 3, pp. 303-310, doi: 10.5267/j.ijdns.2021.6.003.

Dorward, A. (2001), "The effects of transaction costs, power and risk on contractual arrangements: a conceptual framework for quantitative analysis", *Journal of Agricultural Economics*, Vol. 52 No. 2, pp. 59-73, doi: 10.1111/j.1477-9552.2001.tb00925.x.

Dwivedi, Y.K., Ismagilova, E., Hughes, D.L., Carlson, J., Filieri, R., Jacobson, J., Jain, V., Karjaluoto, H., Kefi, H., Krishen, A.S., Kumar, V., Rahman, M.M., Raman, R., Rauschnabel, P.A., Rowley, J., Salo, J., Tran, G.A. and Wang, Y. (2021), "Setting the future of digital and social media marketing research: perspectives and research propositions", *International Journal of Information Management*, Vol. 59, 102168, doi: 10.1016/j.ijinfomgt.2020.102168.

Fihartini, Y., Helmi, R.A., Hassan, M. and Oesman, Y.M. (2021), "Perceived health risk, online retail ethics, and consumer behavior within online shopping during the COVID-19 pandemic", *Innovative Marketing*, Vol. 17 No. 3, pp. 17-29, ISSN 1814-2427 (print), 1816-6326 (online), doi: 10.21511/im.17(3).2021.02.

Gabrielli, P., Aboutalebi, R. and Sansavini, G. (2022), "Mitigating financial risk of corporate power purchase agreements via portfolio optimization", *Energy Economics*, Vol. 109, 105980, doi: 10.1016/j.eneco.2022.105980.

Georgie, N.A. (2021), "The influence of selected factors on online shopping behaviour': a study with respect to Kottayam district", *International Journal of Business and Globalisation*, Vol. 29 No. 3, pp. 376-384, doi: 10.1504/ijbg.2021.10042278.

Gloster, A.T., Lamnisos, D., Lubenko, J., Presti, G., Squatrito, V., Constantinou, M., Nicolaou, C., Papacostas, S., Aydın, G., Chong, Y.Y., Chien, W.T., Cheng, H.Y., Ruiz, F.J., Garcia-Martin, M.B., Obando-Posada, D.P., Segura-Vargas, M.A., Vasiliou, V.S., McHugh, L., Höfer, S., Baban, A., Dias Neto, D., Nunes da Silva, A., Monestès, J.L., Alvarez-Galvez, J., Paez-Blarrina, M., Montesinos, F., Valdivia-Salas, S., Ori, D., Kleszcz, B., Lappalainen, R., Ivanović, I., Gosar, D., Dionne, F., Merwin, R.M., Kassianos, A.P. and Karekla, M. (2020), "Impact of COVID-19 pandemic on mental health: an international study", *PloS One*, Vol. 15 No. 12, e0244809, doi: 10.1371/journal.pone.0244809.

Grabner-Kraeuter, S. (2002), "The role of consumers' trust in online-shopping", *Journal of Business Ethics*, Vol. 39 Nos 1/2, pp. 43-50, doi: 10.1023/a:1016323815802.

Grashuis, J., Skevas, T. and Segovia, M.S. (2020), "Grocery shopping preferences during the COVID-19 pandemic", *Sustainability*, Vol. 12 No. 13, p. 5369, doi: 10.3390/su12135369.

Gu, S., Ślusarczyk, B., Hajizada, S., Kovalyova, I. and Sakhbieva, A. (2021), "Impact of the covid-19 pandemic on online consumer purchasing behavior", *Journal of Theoretical and Applied Electronic Commerce Research*, Vol. 16 No. 6, pp. 2263-2281, doi: 10.3390/jtaer16060125.

Guru, S., Nenavani, J., Patel, V. and Bhatt, N. (2020), "Ranking of perceived risks in online shopping", *Decision*, Vol. 47 No. 2, pp. 137-152, doi: 10.1007/s40622-020-00241-x.

Hadler, N., Locher, I., Waselewski, M., Hoffs, C., Chang, T. and Brandt, E. (2021), "Youth perspectives and experiences with in-person and online grocery shopping during the COVID-19 pandemic", 224, *Current Developments in Nutrition*, Vol. 5 No. Supplement_2, p. 224, doi: 10.1093/cdn/nzab029_025.

Hair, J.F., Anderson, R.E. and Tatham, R. (1998), *Multivariate Data Analysis with Readings*, 2nd and 4th Ed, Prentice-Hall, Englewood Cliffs, NJ.

Hair, J.F., Anderson, R.E., Tatham, R.L., Black, W.C. and Babin, B.J. (2006), *Multivariate Data Analysis*, 6th ed., Pearson Education, New Delhi, pp. 734-735.

Han, S., Min, J. and Lee, H. (2016), "Building relationships within corporate SNS accounts through social presence formation", *International Journal of Information Management*, Vol. 36 No. 6, pp. 945-962, doi: 10.1016/j.ijinfomgt.2016.06.004.

Hu, L. and Bentler, P.M. (1999), "Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives", *Structural Equation Modeling: A Multidisciplinary Journal*, Vol. 6 No. 1, pp. 1-55, doi: 10.1080/10705519909540118.

Im, H., Ju, H.W. and Johnson, K.K.P. (2021), "Beyond visual clutter: the interplay among products, advertisements, and the overall webpage", *Journal of Research in Interactive Marketing*, Vol. 15 No. 4, pp. 804-821, doi: 10.1108/JRIM-10-2020-0213.

Iriani, S.S. and Andjarwati, A.L. (2020), "Analysis of perceived usefulness, perceived ease of use, and perceived risk toward online shopping in the era of Covid-19 pandemic", *Systematic Reviews in Pharmacy*, Vol. 11 No. 12, pp. 313-320.

Islam, M.S., Siddique, A.B., Akter, R., Tasnim, R., Sujan, M.S.H., Ward, P.R. and Sikder, M.T. (2021), "Knowledge, attitudes and perceptions towards COVID-19 vaccinations: a cross-sectional community survey in Bangladesh", *BMC Public Health*, Vol. 21 No. 1, pp. 1-11, doi: 10.1186/s12889-021-11880-9.

Ivanović-Đukić, M., Rađenović, T. and Veselinović, N. (2020), "Impact of Entrepreneurship on Sustainable Development in Emerging Markets under the Conditions of COVID-19 Wpływ przedsiębiorczości na zrównoważony rozwój na rynkach wschodzących podczas pandemii COVID-19", *Problemy Ekorozwoju*, Vol. 17 No. 2, pp. 47-58, doi: 10.35784/pe.2022.2.06.

Johnson, O. and Ramirez, S.A. (2020), "The influence of showrooming on Millennial generational cohorts online shopping behaviour", *International Journal of Retail and Distribution Management*, Vol. 49 No. 1, pp. 81-103, doi: 10.1108/ijrdm-03-2020-0085.

Kaiser, H.F. and Rice, J. (1974), "Little jiffy, mark IV", *Educational and Psychological Measurement*, Vol. 34 No. 1, pp. 111-117, doi: 10.1177/00131644740340011.

Kamaludin, K., Chinna, K., Sundarasen, S., Khoshaim, H.B., Nurunnabi, M., Baloch, G.M. and Hossain, S.F.A. (2020), "Coping with COVID-19 and movement control order (MCO): experiences of university students in Malaysia", *Heliyon*, Vol. 6 No. 11, e05339, doi: 10.1016/j.heliyon.2020.e05339.

Kariyawasam, K. and Guy, S. (2008), "The contractual legalities of buying and selling on eBay: online auctions and the protection of consumers", *Journal of Law, Information and Science*, Vol. 19, pp. 42-72, available at: https://search.informit.org/doi/10.3316/informit.612615810641120

Katrodia, A., Naude, M.J. and Soni, S. (2018), "Consumer buying behavior at shopping malls: does gender matter?", *Journal of Economics and Behavioral Studies*, Vol. 10 No. 1, pp. 125-134, doi: 10.22610/jebs.v10i1(J).2095.

Keating, B.W., Quazi, A.M. and Kriz, A. (2009), "Financial risk and its impact on new purchasing behavior in the online retail setting", *Electron Markets*, Vol. 19 No. 4, pp. 237-250, doi: 10.1007/s12525-009-0021-3.

Khoshaim, H.B., Al-Sukayt, A., Chinna, K., Nurunnabi, M., Sundarasen, S., Kamaludin, K. and Hossain, S.F.A. (2020), "Anxiety level of university students during COVID-19 in Saudi Arabia", *Frontiers in Psychiatry*, Vol. 11, 579750, doi: 10.3389/fpsyt.2020.579750.

Kim, N.L. and Im, H. (2021), "Do liberals want curbside pickup more than conservatives? Contactless shopping as protectionary action against the COVID-19 pandemic", *International Journal of Consumer Studies*, Vol. 46 No. 2, pp. 589-600, doi: 10.1111/ijcs.12714.May17.

Ko, H., Jung, J., Kim, J. and Shim, S.W. (2004), "Cross-cultural differences in perceived risk of online shopping", *Journal of Interactive Advertising*, Vol. 4 No. 2, pp. 20-29, doi: 10.1080/15252019.2004.10722084.

Koch, J., Frommeyer, B. and Schewe, G. (2020), "Online shopping motives during the COVID-19 pandemic—lessons from the crisis", *Sustainability*, Vol. 12 No. 24, 10247, doi: 10.3390/su122410247.

Korgaonkar, P.A. and Karson, E.J. (2007), "The influence of perceived product risk on consumers'e-tailer shopping preference", *Journal of Business and Psychology*, Vol. 22 No. 1, pp. 55-64, doi: 10.1007/s10869-007-9044-y.

Kotler, P. and Armstrong, G. (2008), *Principles of Marketing*, Pearson Prentice Hall, NJ.

Lăzăroiu, G., Neguriţă, O., Grecu, I., Grecu, G. and Mitran, P.C. (2020), "Consumers' decision-making process on social commerce platforms: online trust, perceived risk, and purchase intentions", *Frontiers in Psychology*, Vol. 11, p. 890, doi: 10.3389/fpsyg.2020.00890.

Lim, M.H., Eres, R. and Vasan, S. (2020), "Understanding loneliness in the twenty-first century: an update on correlates, risk factors, and potential solutions", *Social Psychiatry and Psychiatric Epidemiology*, Vol. 55 No. 7, pp. 793-810, doi: 10.1007/s00127-020-01889-7.

Lissitsa, S. and Kol, O. (2021), "Four generational cohorts and hedonic m-shopping: association between personality traits and purchase intention", *Electron Commer Res*, Vol. 21 No. 2, pp. 545-570, doi: 10.1007/s10660-019-09381-4.

Mahmood, Y., Rashid, A., Rizwan, F. and Ahmad, M. (2021), "The role of macroeconomic and institutional factors in creating corporate financial flexibility", *Management Decision*, Vol. 59 No. 4, pp. 732-746, doi: 10.1108/md-12-2018-1332.

Makhitha, K.M. and Ngobeni, K. (2021), "The influence of demographic factors on perceived risks affecting attitude towards online shopping", *South African Journal of Information Management*, Vol. 23 No. 1, pp. 1-9, doi: 10.4102/sajim.v23i1.1283.

Marceda Bach, T., da Silva, W.V., Mendonça Souza, A., Kudlawicz-Franco, C. and da Veiga, C.P. (2020), "Online customer behavior: perceptions regarding the types of risks incurred through online purchases", *Palgrave Commun*, Vol. 6 No. 1, p. 13, doi: 10.1057/s41599-020-0389-4.

Masud, A.A. (2022), "Factors determining financial reporting quality: an empirical study on the publicly listed food and allied companies of Bangladesh", *International Journal of Management, Accounting and Economics*, Vol. 8 No. 8, pp. 585-628, doi: 10.5281/zenodo.5750783.

Mathur, M. and Gangwani, S. (2021), "Mediating role of perceived value on the relationship among perceived risks, perceived quality, and purchase intention of private label brands", *International Journal of Applied Management and Technology*, Vol. 20 No. 1, p. 4, doi: 10.5590/ijamt.2021.20.1.04.

Maziriri, E.T. and Chuchu, T. (2017), "The conception of consumer perceived risk towards online purchases of apparel and an idiosyncratic scrutiny of perceived social risk: a review of literature", *International Review of Management and Marketing*, Vol. 7 No. 3, pp. 257-265.

Moon, J., Choe, Y. and Song, H. (2021), "Determinants of consumers' online/offline shopping behaviours during the COVID-19 pandemic", *International Journal of Environmental Research and Public Health*, Vol. 18 No. 4, p. 1593, doi: 10.3390/ijerph18041593.

Akhtar, N., Nadeem Akhtar, M., Usman, M., Ali, M. and Iqbal Siddiqi, U. (2020), "COVID-19 restrictions and consumers' psychological reactance toward offline shopping freedom restoration", *The Service Industries Journal*, Vol. 40 Nos 13-14, pp. 891-913, doi: 10.1080/02642069.2020.1790535.

Neger, M. and Uddin, B. (2020), "Factors affecting consumers' internet shopping behavior during the COVID-19 pandemic: evidence from Bangladesh", *Chinese Business Review*, Vol. 19 No. 3, pp. 91-104, doi: 10.17265/1537-1506/2020.03.003.

Nguyen, C., Tran, D., Nguyen, A. and Nguyen, N. (2021), "The effects of perceived risks on food purchase intention: the case study of online shopping channels during COVID-19 pandemic in Vietnam", *Journal of Distribution Science*, Vol. 19 No. 9, pp. 19-9, doi: 10.15722/jds.19.9.202109.19.

Nurunnabi, M., Hossain, S.F.A.H., Chinna, K., Sundarasen, S., Khoshaim, H.B., Kamaludin, K. and Shan, X. (2020), "Coping strategies of students for anxiety during the COVID-19 pandemic in China: a cross-sectional study", Vol. 9, F1000Research, doi: 10.12688/f1000research.25557.1.

Ofori, D. and Appiah-Nimo, C. (2019), "Determinants of online shopping among tertiary students in Ghana: an extended technology acceptance model", *Cogent Business and Management*, Vol. 6 No. 1, 1644715, doi: 10.1080/23311975.2019.1644715.

Otika, U., Olise, E. and Oby, O.B. (2019), "Risk perceptions and online shopping intention among internet users in Nigeria", *Global Journal of Management And Business Research*, Vol. 19 No. 6.

Park, S. and Tussyadiah, I.P. (2017), "Multidimensional facets of perceived risk in mobile travel booking", *Journal of Travel Research*, Vol. 56 No. 7, pp. 854-867, doi: 10.1177/0047287516675062.

Pauzi, S.F.F., Thoo, A.C., Tan, L.C., Muharam, F.M. and Talib, N.A. (2017), "Factors influencing consumers intention for online grocery shopping–a proposed framework", *Paper presented at the In IOP Conference Series: Materials Science and Engineering*, IOP Publishing.

Pentz, C.D., Du Preez, R. and Swiegers, L. (2020), "To bu (Y) or not to bu (Y): perceived risk barriers to online shopping among South African generation Y consumers", *Cogent Business and Management*, Vol. 7 No. 1, 1827813, doi: 10.1080/23311975.2020.1827813.

Pham, V.K., Nguyen, T.L., Do, T.T.H., Tang, M.H. and Thu Hoai, H.L. (2020), "A study on switching behavior toward online shopping of Vietnamese consumer during the Covid-19 time", *SSRN*, doi: 10.2139/ssrn.3651300.

Prasad, R.K. and Srivastava, M.K. (2021), "Switching behavior toward online shopping: coercion or choice during Covid-19 pandemic", *Academy of Marketing Studies Journal*, Vol. 25, pp. 1-15, 1528-2678-25-SI-1-380.

Qalati, S.A., Vela, E.G., Li, W., Dakhan, S.A., Hong Thuy, T.T. and Merani, S.H. (2021), "Effects of perceived service quality, website quality, and reputation on purchase intention: the mediating and moderating roles of trust and perceived risk in online shopping", *Cogent Business and Management*, Vol. 8 No. 1, 1869363, doi: 10.1080/23311975.2020.1869363.

Ramus, K. and Asger Nielsen, N. (2005), "Online grocery retailing: what do consumers think?", *Internet Research*, Vol. 15 No. 3, pp. 335-352, doi: 10.1108/10662240510602726.

Rana, I.A., Bhatti, S.S., Aslam, A.B., Jamshed, A., Ahmad, J. and Shah, A.A. (2021), "COVID-19 risk perception and coping mechanisms: does gender make a difference?", *International Journal of Disaster Risk Reduction*, Vol. 55, 102096, doi: 10.1016/j.ijdrr.2021.102096.

Rashed Alhaimer (2022), "Fluctuating attitudes and behaviors of customers toward online shopping in times of emergency: the case of Kuwait during the COVID-19 pandemic", *Journal of Internet Commerce*, Vol. 21 No. 1, pp. 26-50, doi: 10.1080/15332861.2021.1882758.

Rasty, F., Mirghafoori, S.H., Saeida Ardekani, S. and Ajdari, P. (2021), "Trust barriers to online shopping: investigating and prioritizing trust barriers in an intuitionistic fuzzy environment", *International Journal of Consumer Studies*, Vol. 45 No. 5, pp. 1030-1046, doi: 10.1111/ijcs.12629.

Reddy, P., Sharma, B. and Chaudhary, K. (2020), "Digital literacy: a review of literature", *International Journal of Technoethics (IJT)*, Vol. 11 No. 2, pp. 65-94, doi: 10.4018/IJT.20200701.oa1.

Robinson, L., Schulz, J., Khilnani, A., Ono, H., Cotten, S., Mcclain, N., Levine, L., Chen, W., Huang, G., Casilli, A.A., Tubaro, P., Dodel, M., Quan-Haase, A., Ruiu, M.L., Ragnedda, M., Aikat, D. and Tolentino, N. (2020), "Digital inequalities in time of pandemic: COVID-19 exposure risk profiles and new forms of vulnerability", *First Monday*, Vol. 25 No. 7, doi: 10.5210/fm.v25i7.10845.

Ryu, H.-S. and Ko, K.S. (2020), "Sustainable development of fintech: focused on uncertainty and perceived quality issues", *Sustainability*, Vol. 12 No. 18, p. 7669, MDPI AG, doi: 10.3390/su12187669.

Saini, G., Budhwar, V. and Choudhary, M. (2022), "Review on people's trust on home use medical devices during COVID-19 pandemic in India", *Health and Technology*, Vol. 12 No. 2, pp. 527-546, doi: 10.1007/s12553-022-00645-y.

Sajid, S., Rashid, R.M. and Haider, W. (2022), "Changing trends of consumers' online buying behavior during COVID-19 pandemic with moderating role of payment mode and gender", *Frontiers in Psychology*, Vol. 13, 919334, doi: 10.3389/fpsyg.2022.919334.

Sangameshwara, T., Nagesh, P. and Bharath, S. (2022), "Critical risk features of digital buying: a quantitative assessment", *Indian Journal of Science and Technology*, Vol. 15 No. 46, pp. 2589-2593, doi: 10.17485/IJST/v15i46.2072.

Schreiber, J.B., Stage, F.K., King, J., Nora, A. and Barlow, E.A. (2006), "Reporting structural equation modeling and confirmatory factor analysis results: a review", *The Journal of Educational Research*, Vol. 99 No. 6, pp. 323-337, doi: 10.3200/JOER.99.6.323-338.

Sebastianelli, R., Tamimi, N. and Rajan, M. (2008), "Perceived quality of online shopping: does gender make a difference?", *Journal of Internet Commerce*, Vol. 7 No. 4, pp. 445-469, doi: 10.1080/15332860802507164.

Shahri Mejarshin, A., Rousta, A. and Naami, A. (2021), "Investigating the effect of effective factors on actual purchase with the mediating role of purchase intention and the moderating role of

Iranian product type", *Innovation Management and Operational Strategies*, Vol. 2 No. 1, pp. 96-115, doi: 10.22105/IMOS.2021.281500.1061.

Shahzad, H. (2015), "Online shopping behavior", (Dissertation), available at: http://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-262285

Singh, S., Singh, N., Kalinić, Z. and Liébana-Cabanillas, F.J. (2021), "Assessing determinants influencing continued use of live streaming services: an extended perceived value theory of streaming addiction", *Expert Systems with Applications*, Vol. 168, 114241, doi: 10.1016/j.eswa.2020.114241.

Soni, N. and Verghese, M. (2018), "Analyzing the impact of online brand trust on sales promotion and online buying decision", *IUP Journal of Marketing Management*, Vol. 17 No. 3, pp. 237-239.

Sonwaney, V. and Chincholkar, S. (2019), "Identifying the factors impacting online consumer buying behaviour", *International Journal of Scientific and Technology Research*, Vol. 8 No. 08, pp. 445-456.

Sreya, R. and Raveendran, P.T. (2016), "Dimensions of perceived risk in online shopping-A factor analysis approach", *BVIMSR's Journal of Management Research*, Vol. 8 No. 1, p. 13.

Stewart, D.W. (1981), "The application and misapplication of factor analysis in marketing research", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 51-62, doi: 10.2307/3151313.

Sundarasen, S., Chinna, K., Kamaludin, K., Nurunnabi, M., Baloch, G.M., Khoshaim, H.B. and Sukayt, A. (2020), "Psychological impact of COVID-19 and lockdown among university students in Malaysia: implications and policy recommendations", *International Journal of Environmental Research and Public Health*, Vol. 17 No. 17, p. 6206, doi: 10.3390/ijerph17176206.

Taufik, R., Syafei, R.S., Lumban Tobing, F.F., Aditia, S., Febriansyah, Y.I., Purnomo, A. and Sinaga, O. (2021), "The effects of perceived quality and brand trust on purchase intention on the body shop products", *Review of International Geographical Education Online*, Vol. 11 No. 3, pp. 1416-1422, doi: 10.48047/rigeo.11.3.133.

Teo, E.A.L., Ling, F.Y.Y. (2005), "Framework for project managers to manage construction safety", *International Journal of Project Management*, Vol. 23 No. 4, pp. 329-341, doi: 10.1016/j.ijproman.2004.09.001.

Tobias, S. and Carlson, J.E. (1969), "Brief report: bartlett's test of sphericity and chance findings in factor analysis", *Multivariate Behavioral Research*, Vol. 4 No. 3, pp. 375-377, doi: 10.1207/s15327906mbr0403_8.

Truong, D. and Truong, M.D. (2022), "How do customers change their purchasing behaviors during the COVID-19 pandemic?", *Journal of Retailing and Consumer Services*, Vol. 67, 102963, doi: 10.1016/j.jretconser.2022.102963.

Valaskova, K., Durana, P. and Adamko, P. (2021), "Changes in consumers' purchase patterns as a consequence of the COVID-19 pandemic", *Mathematics*, Vol. 9 No. 15, p. 1788, doi: 10.3390/math915178.

Vancic, A. and Pärson, G.F.A. (2020), "Changed buying behavior in the COVID-19 pandemic : the influence of price sensitivity and perceived quality", (Dissertation), available at: http://urn.kb.se/resolve?urn=urn:nbn:se:hkr:diva-20904

Wai, K., Dastane, D.O., Johari, Z. and Ismail, N.B. (2019), "Perceived risk factors affecting consumers' online shopping behaviour", *The Journal of Asian Finance, Economics and Business*, Vol. 6 No. 4, pp. 246-260, doi: 10.13106/jafeb.2019.vol6.no4.249.

Wu, M., Han, H., Lin, T., Chen, M., Wu, J., Du, X., Su, G., Wu, D., Chen, F., Zhang, Q., Zhou, H., Huang, D., Wu, B., Lai, T. and Lai, T. (2020), "Prevalence and risk factors of mental distress in China during the outbreak of COVID-19: a national cross-sectional survey", *Brain and Behavior*, Vol. 10 No. 11, e01818, doi: 10.1002/brb3.1818.

Yahaya Nasidi, Q., Hassan, I. and Fazil Ahmad, M. (2021), "Mediating role of social media in the relationship between reliability, perceived usefulness on online shopping behaviour: building a

conceptual framework", *International Journal of Academic Research in Business and Social Sciences*, Vol. 11 No. 2, doi: 10.6007/ijarbss/v11-i2/8834.

Yuen, K.F., Wang, X., Ma, F. and Li, K.X. (2020), "The psychological causes of panic buying following a health crisis", *International Journal of Environmental Research and Public Health*, Vol. 17 No. 10, p. 3513, doi: 10.3390/ijerph17103513.

Corresponding author
T.S. Nanjundeswaraswamy can be contacted at: nswamy.ts@gmail.com