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Scale development and validation for usage of social networking sites during COVID-19

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ABSTRACT

This research aims to explore the usage of social networking sites in the midst of the COVID-19 pandemic. To achieve the objective, this study develops and validates a scale to measure the usage of social networking sites. Data was collected via a google form link through social networking sites in India viz. Facebook, Instagram, Twitter, Telegram and WhatsApp. A total of 204 responses were found accurate and useable for the study. The population of the study includes people residing in India. Data was analyzed applying SPSS 20 and AMOS 22.0. To design and validate the scale, both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were used in conjunction with each other. The EFA results indicate a six-factor structure, explaining 73.43% of the cumulative variance, with all the items loading above 0.70. Thus, all the 20 items of six constructs meet this threshold limit. Therefore, this 20-items questionnaire emerges as an effective tool for assessing social networking usage. This study developed and validated the scale of usage of social networking sites to measure the six constructs informativeness, education, entertainment, shopping, socialization and social cause. Social media developers and analysts can use this scale from a technological standpoint to redesign and refine their websites for a better user interface. Since the research is primarily focused on India, extrapolating the results to other countries is difficult.

1. Introduction

The increasing popularity and adaptability of social networking sites has opened new avenues for usage in daily life and has widened their scope in a number of ways. People tend to use social networking sites for sharing, communicating and establishing connections with others [4]. The prosperous increase of applications has influenced consumer behavior to a large extent [5]. People are increasingly sharing their everyday lives on social media as well as keeping close connections with family, friends, relatives and teachers [6,7]. The scope and complexity of social media usage is vast. It serves as a source of entertainment, connection, and information [8]. According to Wright and Hinson (2009) (as cited in Ref. [9], social media tools and apps allow for interactive communication and information sharing between audiences and organizations via the use of various platforms. The widespread popularity of social media tools has changed the landscape of usage. Social media tools have been widely used in crises management by government and non-government organizations [10].

The first case of COVID-19 was reported in China at the end of December 2019. Soon after it, COVID-19 busted out worldwide due to the high transmission rate and the absence of sufficient treatment measures. In the meantime, a research group at the University of Oxford created the Oxford COVID-19 Government Response Tracker (OxCGRT), which offers a systematic collection of cross-national, longitudinal measurements of government responses throughout the globe. It is a project of the Oxford University Department of International Development [11]. Over 180 countries participated in the OxCGRT’s data collection, which includes information on government policies on closure and confinement, health and economic issues. The database of OxCGRT contains publicly available information on 21 important indicators of government reactions to COVID-19 [12]. Based on government responses to these indicators, the Stringency Index (SI) was calculated.

According to the World Health Organization (WHO), the first incidence of COVID-19 in India was reported on January 30, 2020, and the counting grew up to 100th case as of March 14, 2020. The number of infected people continued to rise rapidly until April 13, 2020, and the 1000th case was announced on May 18, 2020. The overall number of
infected persons surpassed one lakh on June 12, 2020, and the count exceeded two lakhs very soon [12]. At the end of January 2020, the SI of India was 10.19, following the preventive measure taken by the government. Between March 25, 2020, and April 19, 2020, India’s SI stood at the threshold value of 100, owing to the strict lockdown imposed by the Indian government. At the end of June 2020, the Stringency level of India stood at 87.5 [13].

In 2020, after the spread of coronavirus in the world and the imposition of lockdown across the countries, social networking sites witnessed differences in usage time among individuals [14]. In 2020, the average time spent on social media by US users increased significantly by 65 min per day [15,16], while there was a massive shift of 130 min per day in social media usage by Indians in the first phase of nationwide lockdown [17]. A report by Forbes has reported that in one day (on February 28, 2020), coronavirus (as a keyword) was reported by 6.7 million users on social media [18]. Another social media analytics company Sprinklr says that approximately 20 million individuals discussed coronavirus related keywords on March 11, 2020 [18]. Social media encourages online word of mouth contact during a crisis, serving as an informal channel for real product/service contact or knowledge to be conveyed, exchanged, or stored within an entity [9]. Previous studies mainly emphasized the informative nature of social media during crisis management. There are other roles of social media during the crisis, which need to be explored, and the usage behaviour of individuals need to be identified. In light of the discussion, the primary goal of this research is to determine the extent to which people use social networking sites during the recent health crisis, that is, COVID-19. As a result, the current research explores how people used social networking sites in the meantime of COVID-19. Furthermore, it identifies various roles of social networking sites in crisis-like situations in the daily lives of individuals.

2. Literature review

2.1. Theoretical background of social networking usage

With the imposition of quarantine, social distancing, and self-isolation, virtual communication networks play a significant role in disseminating information since a major chunk of the world population relies on social media platforms for news and information [19]. With the increasing smartphone addiction among the masses, especially students [20], the number of people using social media has surpassed 3.6 billion, accounting for about half of the world’s population [15,16]. This staggering figure reflects the growing prevalence of social media among the general public. According to market research firm Nielson, due to the COVID-19 pandemic, social media activity in India increased by 50 times in early March 2020 [21]. As of March 24, 2020, the total number of COVID-19 related talks in the country has reached 22.3 million. According to a survey, social media chatter grew as COVID-19 confirmed cases grew from 0.4 million in January 2020 to 1.6 million in February 2020 and then reached a new high of 22.3 million in March 2020 [22]. Prasun Basu, the president of South Asia Zonal firm, said, “Social media volume doubled in the same period as pantry preparation picked up significantly when social distancing and quarantining became the new norm”. An increase in internet purchasing outweighed a decrease in in-store buying [22]. He further said, “Each time PM Modi addressed the nation to make announcements such as Janata Curfew and 21-day total lockdown in March, social media volume noted a jump. Celebrities, cricketers and politicians urging people to follow the lockdown and 5-min gratitude showing on Janata Curfew-day were other instances”.

With younger generations acquainted with using new technologies [23], people learn more methods and new ways every day about the potential benefits of these technologies, such as social media platforms and their usage during the global emergency [8]. In the world of information technology, social media is the primary source of information for people around the globe [19]. The massive network of social media platforms, which has mind-boggling speed, scope and penetration, has collated many other ways of exchanging content [24]. At the time of the COVID-19 outbreak, the use of social media has skyrocketed to an all-time high, reaching a staggering proportion. A report of Business Today says that an 87% hike in social media usage has been reported amid lockdown in India. According to the survey, social media use was 150 min a day on average before the lockdown but increased to 280 min each day during the lockdown’s first week [17]. The report further pointed out that Facebook, Twitter, and WhatsApp were more popular amid lockdown as 75% of individuals spent more time on these social media platforms than they did before the lockdown period.

AmaSocial, a social media tracking and reporting service team, says that since people started practising social distancing globally and countries started imposing nationwide lockdown, an upsurge in social media usage has been recorded. Loneliness is one of the reasons of that shift in social media usage during lockdown [25]. Since people were unable to meet up with their friends in person, they connected with them virtually, resulting in a rise in the number of minutes spent on social media [26]. This report further says that social media sites, mainly Facebook, Twitter, YouTube, Instagram, Zoom and Skype, witnessed increased traffic since the global pandemic began. The fact behind the surge of social media usage is that humans are social beings. After a couple of days in lockdown or quarantine, people started missing physical social bonding and opted for virtual platforms to fulfill this need. In the crisis of the global pandemic, social media offers new avenues to fill this void. With other social media platforms, India based messaging App Hike also noticed a remarkable increase in its users’ traffic. It witnessed a 33% spike in its daily usage time amid the COVID-19 pandemic lockdown. The surge in social media usage is recorded mainly from the severely infected areas by the virus [27].

In the crisis of the COVID-19 pandemic, when social and physical distancing was used as a preventive measure to combat the disease, the role of various social media sites in the lives of individuals could not be underestimated [28]. More than 93.4% of internet users are now connected to one or more social media platforms, which is around 57.6% of world’s population [29]). And it is not just about keeping in touch with friends or following news or interests. As social media continues to play a pervasive role in the way people think, act and react to the world, it is also changing one of the most crucial ways of actually helping the world: how people respond to emergencies and disasters. In the event of crisis, people are eager to participate in the information-sharing process through various social networking sites [30]. Paul [31] says that the range of state officials, other organizations, and individuals have all used social media to respond to emergencies. Social networking platforms have been critical in recent years in responding to crises and natural catastrophes [32]. Sutton et al. [33] examined the resident population in the event of a crisis and studied the evolution of social media usage. According to them, ‘social media supports backchannel communication, allowing for wide-scale interaction between members of the public that has qualities of being collectively resourceful, self-policing and generative of information that cannot otherwise be easily obtained’.

The report of Congressional Research Service states “individuals and communities have used social media sites to warn others of unsafe areas or situations, inform friends and family that someone is safe, and raise funds for disaster relief. Facebook supports numerous emergency-related organizations, including Information Systems for Crisis Response and Management (ISCRAM), The Humanitarian Free and Open-Source Software (FOSS) Project, as well as numerous universities with disaster-related programs” [32]. The scope of social networking usage is pervasive as it extends to crisis informatics during emergencies or disasters and retrodating during the crisis [2,35].

2.2. Issues and challenges of the usage of social networking sites during the COVID-19

The COVID-19 pandemic sparked a global public health crisis [36].
People had to overcome numerous obstacles before they could return to living their normal lives as before. In order to stay informed about their own and their loved ones, individuals are turning to internet news sources, such as social media, in greater numbers than normal [37]. Indeed, people have been able to assess health hazards and handle global health challenges thanks to social media platforms like Facebook and Twitter [3,39]. But dealing with the misinformation while using social media is one of the biggest challenges during the COVID-19, as social media is among the most common sources of misinformation related to COVID-19 [40]. Farooq et al. [41] in their study, found out that excessive use of social media during COVID-19 results in information overload among people. Varying the usage of social media, individuals have their own issues and challenges to combat during the COVID-19.

2.3. Previous measures of social networking usage

Following an examination of the available research on social networking use, it was determined that a variety of metrics had been developed to investigate social networking use. Table 1 present the instruments developed and methods used by different researchers previously.

Pornsakulvanich and Dumrongsiri [42] developed an instrument that looked at six aspects: “friendship, passing time, relationship management, staying current, entertainment, and relaxing”. This instrument was used to ascertain how well respondents assessed their specific reasons for utilizing social networking sites. Furthermore, Eid and Al-Jabri [43] standardized a social networking survey questionnaire of four categories, “fun and entertainment, file sharing, content production, online conversation, and chatting”. Additionally, Jenkins-Guarnieri et al. [44] developed a social networking usage matrix that evaluates users’ everyday routine, a mixture of social actions, and the emotional correlation and significance of their use. Many other researchers, Bolar [45]; Shi et al. [46] and Shin and Lim [47] also developed instruments to measure social networking sites usage from strongly disagree to strongly agree on a five-point Likert scale. These scales contain various subscales, which are “enjoyment, social, mood regulation, pastime and conformity”. Gupta and Basheer [4] developed a scale for measuring social media usage, taking academic, socialization, entertainment and informativeness. Some of the constructs are found suitable from this scale and were considered for the present study.

However, to the best of researchers’ knowledge, no instrument measures the usage of social networking sites during an emergency, health crisis, natural calamity similar to the recent COVID-19 pandemic. The instruments developed by Bolar [45]; Jenkins-Guarnieri et al. [44]; Shi et al. [46]; Eid and Al-Jabri [43]; and Shin and Lim [47] have not done full psychometric statistics, including test-retest reliability coefficient estimates and have only provided metrics that are only loosely defined making it difficult to evaluate their instruments. Also, most of these studies were conducted on young people, such as college and university students, and thus a wide spectrum and variety of motives could not be identified from these studies. Though all these scales have been developed to measure social media usage, they were carried out in different contexts other than the purview of the present study. Thus, the present research fills this gap by presenting a series of items that were developed to assess social networking usage in the context of the COVID-19 pandemic and for direct applicability to the Indian context.

3. Methodology

On the basis of the theoretical background of the study, statements were formulated related to the usage of social networking sites. The formulated statements were designed and aimed to get the social networking usage of the Indian users during the COVID-19 pandemic lockdown period. As a result, the current scale was developed using the summated evaluation techniques suggested by Likert [48]. From previously designed instruments, researchers identified a total of 29 items related to social networking usage. These assertions were all aligned to be responded to on a five-point Likert scale, with each argument scored on five piers: “always = 5, often = 4, occasionally = 3, rarely = 2, and never = 1”. Two experts cross-checked the scale for their comments to verify the face validity of the questionnaire [49], which culminated in a 29 items scale after deleting and inserting items. The detailed literature review outlined above helped the researchers develop a measurement instrument on social networking usage with strong psychometric properties. When the items are used in a Likert format, they prove to be more strong and solid [50].

This study is exploratory in nature and mainly depends on primary data. The questionnaire method was employed to collect the information for finding out the usage of social networking sites during the COVID-19 pandemic lockdown period in India. The questionnaire method assists a researcher in obtaining information about the present situation [51]. The main motive of using this method is to explore the usage of social networking sites and the behavioural pattern of individuals during the COVID-19 lockdown.

Data was collected through a self-structured online questionnaire via google form that was floated on different social networking sites viz. Facebook, Twitter, Instagram, Twitter, Telegram and WhatsApp. A total of 256 responses were collected from April 16, 2020, to June 30, 2020, during the lockdown period in India, but only 204 responses were found accurate and useable for the study. Fifty-two questionnaires were found

Table 1
Previous measures of social networking usage.

| Authors          | Year | Country | Constructs                                      | Methods          |
|------------------|------|---------|-------------------------------------------------|------------------|
| Bolar            | 2009 | India   | Self-Reflection and Image-Building, Utility, Information- | Inferential Statistics and Principal Component Analysis |
| Jenkins-Guarnieri et al. | 2013 | USA     | Social Behavior, Daily Routine of Users, and Emotional Correlation | Factor Analysis   |
| Pornsakulvanich and Dumrongsiri | 2013 | Thailand | Passing Time, Friendship, In Trend, Relationship Maintenance, Entertainment, and Relaxation | Descriptive and Inferential Statistics |
| Shi et al.       | 2014 | China   | Basic usage, Interactive Usage, and Self-Display Usage | Inferential Statistics and Factor Analysis |
| Eid and Al-Jabri | 2016 | Saudi Arabia | Chatting and Online discussion, Creating Knowledge and Information Content, File sharing, and Enjoyment and Entertainment | Inferential Statistics and Partial Least Square (PLS) Method |
| Gupta and Basheer | 2018 | India   | Academic, Socialization, Entertainment, and Informativeness | Descriptive Statistics and Factor Analysis |
| Shin and Lim     | 2018 | South Korea | Information, enjoyment, social, Mood Regulation, Pastime, and Conformity | Inferential Statistics and Factor Analysis |

Source: Prepared by the authors
4. Findings

4.1. Demographic profile of the survey participants

An examination of the profiles of social media users found that the majority of those who responded to the survey were men (71.1%), as the ratio of social media users in India during 2018-21 between men and women was 73:27 [52]. A significant chunk of the respondents was recorded from the age group of 25–34 years, which comprised 56.4% of the total respondents. The majority of the respondents were single (77.5%), and approximately half of the social media users had a master’s degree as their educational qualification. Most of the respondents were students, with 66.7% of the total population. For detailed information, see Table 2.

4.2. Pattern of social media usage

As much as 94.6% of respondents have an account on WhatsApp, 85.8% have a Facebook account, followed by YouTube, Instagram and LinkedIn. It was reported that respondents mostly used WhatsApp during the lockdown, followed by YouTube and Facebook. A remarkable change has been recorded in the total time spent on social media prior to and during the lockdown. Only 12.7% of users used to spend 3–5 h per day on social media before lockdown, while this percentage increased to 33.8% during the lockdown. WhatsApp was found the most unreliable social media platform in terms of spreading rumours and false information, while Twitter was registered as the most reliable social media platform by users. For detailed information, see Table 3.

4.3. Exploratory factor analysis

The online survey data was analyzed with the assistance of the SPSS 20 statistical package. EFA was applied to investigate the foundational structure of the data [53]. It provides details of the number of constructs available to represent the data [4]. According to Child [54];

| Demographic Variable | Sub-Variable | Per cent  |
|----------------------|--------------|-----------|
| Gender               | Male         | 71.10     |
|                      | Female       | 28.90     |
| Age                  | Below 18     | 00.50     |
|                      | 18–24        | 35.30     |
|                      | 25–34        | 56.40     |
|                      | 35–44        | 05.90     |
|                      | 45–54        | 01.50     |
|                      | Above 55     | 00.50     |
| Marital Status       | Single       | 77.50     |
|                      | Married      | 21.60     |
|                      | Separated    | 01.00     |
| Education            | High school  | 02.50     |
|                      | Bachelor’s   | 27.90     |
|                      | Master’s     | 51.00     |
|                      | Doctorate    | 16.70     |
|                      | Other        | 02.00     |
| Profession           | Government   | 10.30     |
|                      | Private      | 10.30     |
|                      | Self-employed| 08.30     |
|                      | Unemployed   | 02.50     |
|                      | Student      | 66.70     |
|                      | Others       | 02.00     |

Source: Primary Data

Table 3

| Usage Pattern | Frequency | Per cent |
|---------------|-----------|----------|
| Number of social media sites users have an account with. |  |
| One           | 3         | 1.5      |
| Two           | 21        | 10.3     |
| Three         | 31        | 15.2     |
| Four          | 42        | 20.6     |
| Five          | 33        | 16.2     |
| Six           | 32        | 15.7     |
| Seven         | 20        | 9.8      |
| More than seven | 22    | 10.8     |
| Social media sites users have an account with. |  |
| WhatsApp      | 193       | 94.6     |
| Facebook      | 175       | 85.8     |
| Twitter       | 100       | 49       |
| Instagram     | 143       | 70.1     |
| LinkedIn      | 103       | 50.5     |
| YouTube       | 150       | 73.5     |
| Telegram      | 68        | 33.3     |
| Others        | 5         | 2.5      |
| Time spent on social media before the lockdown. |  |
| Less than 1 h | 46        | 22.5     |
| 1-3 h         | 121       | 59.3     |
| 3-5 h         | 26        | 12.7     |
| 5-7 h         | 9         | 4.4      |
| More than 7 h | 2         | 1        |
| Time spent on social media during the lockdown. |  |
| Less than 1 h | 8         | 3.9      |
| 1-3 h         | 68        | 33.3     |
| 3-5 h         | 69        | 33.8     |
| 5-7 h         | 35        | 17.2     |
| More than 7 h | 24        | 11.8     |
| Social media sites spreading rumours and false information the most. |  |
| WhatsApp      | 111       | 54.4     |
| Facebook      | 71        | 34.8     |
| Twitter       | 5         | 2.5      |
| Instagram     | 1         | 0.5      |
| LinkedIn      | 0         | 0        |
| YouTube       | 10        | 4.9      |
| Telegram      | 1         | 0.5      |
| Others        | 5         | 2.5      |
| The most reliable social media site in terms of information. |  |
| WhatsApp      | 10        | 4.9      |
| Facebook      | 12        | 5.9      |
| Twitter       | 88        | 43.1     |
| Instagram     | 14        | 6.9      |
| LinkedIn      | 30        | 14.7     |
| YouTube       | 32        | 15.7     |
| Telegram      | 3         | 1.5      |
| Others        | 15        | 7.4      |

Source: Primary Data

“Exploratory Factor Analysis helps discover the probable original factor construction of a set of observed variables not having imposing a predetermined structure on the consequence”. As a result, EFA was carried out on 29 items representing the six constructs to sublime the measurement scale of social networking usage. Principal component analysis [55] was used for extraction, and varimax rotation with Kaiser normalization was used for the rotation method. To ascertain the number of variables, the parameters of eigenvalue >1 and the total percentage of variance explained >50% was used. For the findings, the Kaiser–Meyer–Olkin sampling adequacy scale is 0.787, with a given value greater than 0.50 considered acceptable [5]. Tabachnick and Fidell [56] claim that “the minimum Kaiser-Meyer-Olkin (KMO) value for a good factor structure should be 0.6”. The value of KMO (0.787)
satisfies both criteria and suggests that sample data is adequate enough for the purpose of factor analysis. Bartlett’s test of Sphericity is high (2041.012) with a 0.000 level of significance, and the degree of freedom is 190, which demonstrates that the factors are interconnected. The detailed information is exhibited in Table 4.

Out of the 29 initial total items, nine items were removed as a result of very low factor loadings and cross-loadings, one from informativeness and education, two from entertainment and socialization, and three items from social cause in two rounds of EFA. On the last 20 items, EFA was run a third time, this time with the items placed into the six factors. The detailed information on EFA is exhibited in Table 5. For the results of CFA, see Fig. 1.

Using EFA, the findings show that there is a six-factor structure that accounts for 73.43% of the cumulative variance, with all the items loading above 0.70 except SOC3 (0.586). According to Truong and McColl [57]; Hulland [58] and Chen and Tsai [59]; factor loading above 0.5 is considered acceptable for better results. Thus, all the 20 items of six constructs meet this threshold limit. Therefore, for measuring social networking usage, this 20-items questionnaire is the final scale.

4.4. Reliability analysis

The Cronbach’s alpha is utilized to evaluate the reliability of a test and to measure how consistent internally the objects are. The reliability coefficient alpha usually varies between 0 and 1 [1]. According to George and Mallery [61]; “the thumb rule for interpreting Cronbach’s alpha is that it should be greater than 0.80”. Hence, the current Cronbach’s alpha of social networking usage (0.840) shows high internal consistency. As a consequence, reliability analysis reveals that the instrument of social networking usage is internally reliable and consistent, as shown by the findings. For detailed information, see Table 6.

4.5. Convergent validity

Convergent validity indicates whether or not the items or factors within a measure are strongly associated with one another or not (see Table 6). Factor loadings of constructs show convergent validity. According to Gaskin [62]; an average loading of greater than 0.70 is ideal for each component. In Table 7, the average loading of all six variables is higher than 0.70, indicating that convergent validity exists in this situation. As a result, convergent validity is proven. For detailed information, see Table 7.

4.6. Discriminant validity

The extent to which variables are unrelated is indicated by their discriminant validity. This is because variables are anticipated to be closely related to their own factor. Correlations between variables should not be greater than 0.70 [5]. Table 8’s factor correlation matrix clearly demonstrates that the inter-construct correlation value cannot be higher than 0.70. This means that none of the variables in the matrix is strongly correlated with one another. This proves that the discriminant validity was established.

5. Discussion and conclusion

In today’s tumultuous world filled with chaos and jeopardy due to the ongoing COVID-19 pandemic, the questionnaire built in this study will contribute to a more accurate estimate of social networking usage. The constructs explored in this study will be helpful to measure the usage of social networking, mainly in an emergency, health crisis, natural calamity similar to the COVID-19 pandemic.

This study explores six constructs of social networking usage in an effort to add to an under-researched field. A 20 items scale has been created to investigate the usage of social networking during an emergency, health crisis, natural calamity similar to the COVID-19 pandemic. A 20 items scale has been created to investigate the usage of social networking during an emergency, health crisis, natural calamity similar to the COVID-19 pandemic.
The aim of this research was to develop and verify an instrument of social networking usage in order to bring a more complete knowledge of social networking use during a global health emergency. The study is based on an analysis of various studies that have measured social networking usage in different settings. A rigorous systematic statistical procedure was carried out in this study to develop and validate the method of measuring social networking usage. The scale developed in this study has adequate methodological and theoretical support. The components identified by EFA and confirmed by CFA have been used in a variety of relevant empirical studies. Kio [63] used the ‘education’ aspect, while Wijesundara [64]; Pornsakulvanich and Dumrongsi [42]; and Park [65] used the ‘socialization’ factor. Griffiths [66]; Wijesundara [64]; Sridhar [67]; Eid and Al-Jabri [43]; and Pornsakulvanich and Dumrongsi [42] used the ‘entertainment’ factor, and Eid and Al-Jabri [43]; Park [65]; Mahajan et al. [68]; and Sridhar [67] all used the term informativeness. To the best of researcher’s knowledge, no single study has validated all the six constructs altogether viz. informativeness, education, entertainment, shopping, socialization and social cause. Socialization, entertainment and informativeness are the constructs that have been validated in previous studies. The uniqueness of the present study lies in the fact that shopping and social cause are the two novel constructs that have been developed and tested in the backdrop of COVID-19. Moreover, rest of the four constructs also have been validated in the context of COVID-19. The findings of this research suggest that this questionnaire has adequate psychometric characteristics for assessing social networking use. This study would provide academicians and researchers with much-needed methods and a new methodological insight while doing empirical studies on the concept of social networking usage.

6. Implications

This research contributes to the existing literature in many ways. First, it extends the literature on the usage of social media during the COVID-19. The present study offers a strong theoretical base to understand the social media usage behavior in a crisis like COVID-19 and highlights the relevance of social media during the COVID-19. Second, the 20 items scale, consisting of 6 constructs, developed in this study provide a profound contribution to social media usage behavior research streams. This study empirically develops and statistically validates the scale of social media usage during COVID-19 that would pave the ground for future researchers and academicians. Third, the developed scale provides a vivid description of the important determinants of social media usage that would assist future researchers and academicians in understanding the usage behavior. The scale will not only assist researchers and academicians but also will help marketers and business practitioners to understand how social media users perceive the usage of these sites during any health emergency, natural calamity, disaster or the recent COVID-19. Moreover, web developers would come to know the usage pattern of social media sites and various functionalities of it. It would assist them in developing

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Table 6
Reliability statistics.

| Cronbach’s Alpha | Cronbach’s Alpha Based On Standardized Items | No. of Items |
|------------------|---------------------------------------------|--------------|
| .840             | .837                                        | 20           |

Source: Primary Data

and refine their websites for a greater user interface.

The aim of this research was to develop and verify an instrument of social networking usage in order to bring a more complete knowledge of social networking use during a global health emergency. The study is based on an analysis of various studies that have measured social networking usage in different settings. A rigorous systematic statistical procedure was carried out in this study to develop and validate the method of measuring social networking usage. The scale developed in this study has adequate methodological and theoretical support. The components identified by EFA and confirmed by CFA have been used in a variety of relevant empirical studies. Kio [63] used the ‘education’ aspect, while Wijesundara [64]; Pornsakulvanich and Dumrongsi [42]; and Park [65] used the ‘socialization’ factor. Griffiths [66]; Wijesundara [64]; Sridhar [67]; Eid and Al-Jabri [43]; and Pornsakulvanich and Dumrongsi [42] used the ‘entertainment’ factor, and Eid and Al-Jabri [43]; Park [65]; Mahajan et al. [68]; and Sridhar [67] all used the term informativeness. To the best of researcher’s knowledge, no single study has validated all the six constructs altogether viz. informativeness, education, entertainment, shopping, socialization and social cause. Socialization, entertainment and informativeness are the constructs that have been validated in previous studies. The uniqueness of the present study lies in the fact that shopping and social cause are the two novel constructs that have been developed and tested in the backdrop of COVID-19. Moreover, rest of the four constructs also have been validated in the context of COVID-19. The findings of this research suggest that this questionnaire has adequate psychometric characteristics for assessing social networking use. This study would provide academicians and researchers with much-needed methods and a new methodological insight while doing empirical studies on the concept of social networking usage.

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Table 7
Convergent validity.

| Factor       | Item       | Loading | Average Loadings of Factors |
|--------------|------------|---------|-----------------------------|
| Informativeness | INF3       | .928    | .906                        |
|              | INF1       | .915    |                             |
|              | INF4       | .911    |                             |
|              | INF2       | .871    |                             |
| Education    | EDU2       | .840    | .78.7                       |
|              | EDU1       | .836    |                             |
|              | EDU5       | .769    |                             |
|              | EDU3       | .705    |                             |
| Shopping     | SHO1       | .842    | .821                        |
|              | SHO3       | .820    |                             |
|              | SHO2       | .802    |                             |
| Social Cause | SCA6       | .811    | .769                        |
|              | SCA5       | .798    |                             |
|              | SCA4       | .780    |                             |
| Entertainment| ENT1       | .831    | .779                        |
|              | ENT5       | .794    |                             |
|              | ENT2       | .714    |                             |
| Socialization| SOC2       | .833    | .733                        |
|              | SOC1       | .782    |                             |
|              | SOC3       | .586    |                             |

Source: EFA output

and refine their websites for a greater user interface.

The aim of this research was to develop and verify an instrument of social networking usage in order to bring a more complete knowledge of social networking use during a global health emergency. The study is based on an analysis of various studies that have measured social networking usage in different settings. A rigorous systematic statistical procedure was carried out in this study to develop and validate the method of measuring social networking usage. The scale developed in this study has adequate methodological and theoretical support. The components identified by EFA and confirmed by CFA have been used in a variety of relevant empirical studies. Kio [63] used the ‘education’ aspect, while Wijesundara [64]; Pornsakulvanich and Dumrongsi [42]; and Park [65] used the ‘socialization’ factor. Griffiths [66]; Wijesundara [64]; Sridhar [67]; Eid and Al-Jabri [43]; and Pornsakulvanich and Dumrongsi [42] used the ‘entertainment’ factor, and Eid and Al-Jabri [43]; Park [65]; Mahajan et al. [68]; and Sridhar [67] all used the term informativeness. To the best of researcher’s knowledge, no single study has validated all the six constructs altogether viz. informativeness, education, entertainment, shopping, socialization and social cause. Socialization, entertainment and informativeness are the constructs that have been validated in previous studies. The uniqueness of the present study lies in the fact that shopping and social cause are the two novel constructs that have been developed and tested in the backdrop of COVID-19. Moreover, rest of the four constructs also have been validated in the context of COVID-19. The findings of this research suggest that this questionnaire has adequate psychometric characteristics for assessing social networking use. This study would provide academicians and researchers with much-needed methods and a new methodological insight while doing empirical studies on the concept of social networking usage.

6. Implications

This research contributes to the existing literature in many ways. First, it extends the literature on the usage of social media during the COVID-19. The present study offers a strong theoretical base to understand the social media usage behavior in a crisis like COVID-19 and highlights the relevance of social media during the COVID-19. Second, the 20 items scale, consisting of 6 constructs, developed in this study provide a profound contribution to social media usage behavior research streams. This study empirically develops and statistically validates the scale of social media usage during COVID-19 that would pave the ground for future researchers and academicians. Third, the developed scale provides a vivid description of the important determinants of social media usage that would assist future researchers and academicians in understanding the usage behavior. The scale will not only assist researchers and academicians but also will help marketers and business practitioners to understand how social media users perceive the usage of these sites during any health emergency, natural calamity, disaster or the recent COVID-19. Moreover, web developers would come to know the usage pattern of social media sites and various functionalities of it. It would assist them in developing

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Table 7
Convergent validity.

| Factor       | Item       | Loading | Average Loadings of Factors |
|--------------|------------|---------|-----------------------------|
| Informativeness | INF2       | .928    | .906                        |
|              | INF1       | .915    |                             |
|              | INF4       | .911    |                             |
|              | INF2       | .871    |                             |
| Education    | EDU2       | .840    | .78.7                       |
|              | EDU1       | .836    |                             |
|              | EDU5       | .769    |                             |
|              | EDU3       | .705    |                             |
| Shopping     | SHO1       | .842    | .821                        |
|              | SHO3       | .820    |                             |
|              | SHO2       | .802    |                             |
| Social Cause | SCA6       | .811    | .769                        |
|              | SCA5       | .798    |                             |
|              | SCA4       | .780    |                             |
| Entertainment| ENT1       | .831    | .779                        |
|              | ENT5       | .794    |                             |
|              | ENT2       | .714    |                             |
| Socialization| SOC2       | .833    | .733                        |
|              | SOC1       | .782    |                             |
|              | SOC3       | .586    |                             |

Source: EFA output

Fig. 1. Confirmatory Factor Analysis (Source: AMOS output).
and designing new websites for marketers and business practitioners. By doing so a better consumer experience would be gained that would finally build a strong relationship between the business and customers.

7. Limitations and future research directions

Although researchers used extremely accurate and credible scale development techniques based on those of Churchill [69] and Hinkin [70]; there are still some limitations. The first limitation is that both EFA and CFA used to optimize scales are sample-size dependent. A larger sample size is recommended for future studies to get more accurate findings. The second limitation is that data has been collected during the lockdown of the COVID-19 pandemic from the Indian populace; future researchers could validate the findings of this study in different settings. Third, this study has measured six constructs on the five-point Likert Scale; future researchers could measure more constructs on different scales. Fourth, a comparison of the shared variance between each pair of constructs to the computed average variance should be performed in future research in order to determine discriminant validity. Fifth, though the proposed social networking site scale was developed under a rigorous systematic statistical procedure, some validations are critical to its appropriateness for a global health emergency. Because being a developing nation, India has certain limitations, unlike the developed nations. So, the scale could be used in similar developing nations. If it would be validated in the developed nations, the results could be different.

Authors agreement

Professor Nawab Ali Khan- Investigation, Writing and Supervision. Mohd Azhar- Conceptualization, Methodology, Investigation, Software, Formal Analysis, Writing - Original Draft. Mohd Nayyer Rahman- Investigation, Writing, Review & Editing. Mohd Junaid Akhtar- Conceptualization, Writing, Review and Editing, Visualization and Investigation.

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Declaration of competing interest

There is no conflict of interest to report.

Appendix A

Socialisation

Item 1-1 use social media sites to keep in touch with family and friends.
Item 2-1 use social media sites to strengthening the interpersonal relationship.
Item 3-1 use social media sites to get information regarding current social issues.

Informativeness

Item 1-1 use social media sites to find the latest news.
Item 2-1 use social media sites to gather information related to health and hygiene.
Item 3-1 use social media sites to spread awareness.
Item 4-Social media sites spread rumours and false information.

Entertainment

Item 1-1 use social media sites to get relief from stress.
Item 2-1 use social media sites for watching movies.
Item 3-1 use social media sites for overcoming boredom.

Education

Item 1-1 use social media sites for online academic group discussion and collaborative learning.
Item 2-1 use social media sites to solve my academic problem.
Item 3-1 communicate with my friends via social media sites for the preparation of exam.
Item 4-1 use social media sites for career guidance.

Table 8

| Factor            | Socialization | Entertainment | Social Cause | Shopping | Education | Informativeness |
|-------------------|---------------|---------------|--------------|----------|-----------|-----------------|
| Socialization     | 1             |               |              |          |           |                 |
| Entertainment     | .529**        | .304**        | .524**       | 1        |           |                 |
| Social Cause      | .259**        | .374**        | .393**       | .512**   | 1         |                 |
| Shopping          | .360**        | .554**        |              | .512**   | 1         |                 |
| Education         | .093**        | .268**        | .070**       | .133**   | 1         |                 |
| Informativeness   |               | .090**        |              | .133**   |           | .113**          |

**Significant at 0.01 level.
Source: Primary Data
Social Cause

Item 1- I use social media sites to distribute essential items.
Item 2- I use social media sites for crowdfunding.
Item 3- I use social media sites for civil campaigns.

Shopping

Item 1- I use social media sites to buy essentials.
Item 2- I use social media sites to purchase medicines and health care products.
Item 3- I use social media sites to buy stationery and ebooks.

| Gender       | Male | Female | Others |
|--------------|------|--------|--------|
| Age          | Below 18 | 18-24 | 25-34 |
|              | 35-44 | 45-54 | Above 55 |

| Marital Status | Unmarried | Married | Separated | Widow (er) |
|----------------|-----------|---------|-----------|------------|

| Education       | High school degree or equivalent | Bachelor’s degree |
|-----------------|----------------------------------|-------------------|
|                 | Master’s degree                  | Doctoral degree   |
|                 | Others                           |                   |

| Profession      | Government employee | Private employee |
|-----------------|----------------------|------------------|
|                 | Self-employed        | Unemployed       |
|                 | Student              | Others           |

Number of social media sites have accounts with?

| Number of accounts | 1 | 2 | 3 | 4 | 5 | 6 | 7 | More than 7 |
|--------------------|---|---|---|---|---|---|---|-------------|

Social media sites currently have an account with?

WhatsApp | Facebook | Twitter |
Instagram | LinkedIn | YouTube |
Telegram | Other (Please Specify) |

Social media platform using the most in the period of lockdown?

WhatsApp | Facebook | Twitter |
Instagram | LinkedIn | YouTube |
Telegram | Other (Please Specify) |

Time used to spend on social media before lockdown?

| Time used to spend | Less than 1 hour | 1-3 hours | 3-5 hours | 5-7 hours | More than 7 hours |
|--------------------|------------------|-----------|-----------|-----------|------------------|

Time spent on social media during the lockdown?

| Time spent | Less than 1 hour | 1-3 hours | 3-5 hours | 5-7 hours | More than 7 hours |
|------------|------------------|-----------|-----------|-----------|------------------|

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