Social Media and Depression: Saudi Arabia

وسائل التواصل الاجتماعي والاكتئاب: المجتمع السعودي

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ABSTRACT

The aim of this research is to investigate the effect of online social media (OSM) assimilation on individuals' levels of depression in Saudi Arabia. Over the last decade, Saudi Arabia has witnessed an exponential increase in the number of OSM users. Previous studies suggest that OSM usage can be used as a predictor of many behavioral outcomes for individuals. Nevertheless, the literature on the assimilation and risk of OSM within Saudi Arabia is still very limited, especially in terms of linking OSM to depression. This cross-sectional study adopts a quantitative approach using an online survey of 626 users to measure how OSM assimilation affects levels of depression among users in Saudi Arabia. The analysis was conducted using partial least squares (PLS) regression. The result indicates that OSM usage has a significant negative impact on depression.

الملخص

تهدف هذه الدراسة إلى بحث واستكشاف تأثير الاستخدام المكثف لوسائل الإعلام الجديد ووسائل التواصل الاجتماعي على مستويات الاكتئاب والإحباط لدى أفراد المجتمع السعودي. ومن الملاحظ أن المملكة العربية السعودية شهدت في العقد الأخير ارتفاعًا كبيرًا في أعداد المستخدمين لوسائل الإعلام الجديد وكذا وسائل التواصل الاجتماعي. وقد اقترحت دراسات علمية سابقة إمكانية الاستعانة بمؤشر استخدام وسائل الإعلام الجديد والتواصل الاجتماعي للتنبؤ بنتائج التصرفات السلوكية وردود الأفعال سواء على مستوى الأفراد أو المنظمات. وعلى الرغم من ذلك، فقد وُجدَ قدرٌ محدودٌ من الدراسات الأدبية السابقة اهتمت بدراسة الاستخدام العميق لوسائل الإعلام الجديد والتواصل الاجتماعي وعلاقتها بالمخاطر الناشئة من الاستخدام في نطاق المجتمع السعودي، وبخاصة العلاقة بين الاستخدام ومدى تأثيره على مستويات الاكتئاب. وقد اعتمدت هذه الدراسة منهجية البحوث الكمية من خلال استخدام نتائج استبانات تم جمعها من خلال 626 مستخدمًا من أجل معرفة الكيفية التي يؤثر من خلالها سلوك الاستخدام المكثف لوسائل الإعلام الجديد والتواصل الاجتماعي من قبل أفراد المجتمع السعودي على مستويات الاكتئاب والإحباط. وقد تم تحليل البيانات الكمية من خلال استخدام طريقة المربعات الصغرى الجزئية. وتشير النتائج النهائية إلى أن الاستخدام المكثف لوسائل الإعلام الجديد والتواصل الاجتماعي يحمل تأثيرًا سلبيًّا كبيرًا على درجة الاكتئاب والإحباط لدى أفراد المجتمع.

1. Introduction

Advances in information technology have paved the way for online social media (OSM) to dominate and take over traditional media. The competitive advantages of OSM compared to traditional media can be found in its capability to provide two-way communication, allowing people to actively engage with their communities and the whole world by sharing their knowledge, news, and thoughts and by publishing their own content without restrictions. Although OSM has redefined the way people communicate, its usage can be associated with some undesired effects, which have received attention from researchers and community institutions alike (Hussein, 2016; Munnukka & Järvi, 2014; Saeri et al., 2010; Smith & Louis, 2014; Talwar et al., 2019). For example, people around the world share information with people from different countries freely and without classifications, restrictions, verifications, or filters. As information passes through different cultures, which may have unique beliefs and attributes, it is expected that cultural values will change. This represents a high risk when these effects lead to changes in the behavioral outcomes of vulnerable individuals and groups as well as in society. Therefore, the aim of this study is to investigate the effect of OSM assimilation on individuals' levels of depression in Saudi Arabia.

Over the last decade, Saudi Arabia has witnessed an exponential increase in OSM users. According to the Saudi Ministry of Communications and Information Technology (2019), the country has more than 18 million users (almost 60% of the population), and this has been reached within only a couple of years. This suggests that the society is likely to be impacted by such an expansion in the number of users. Facebook (with 11 million users) tops the list in the country, while Twitter has 9 million users and YouTube has 7 million users.

The rational for this study is manifold. First, although various OSM platforms and apps are highly popular among Saudi users, there is a lack of in-depth empirical studies to understand this phenomenon (excluding Facebook and Twitter, which have received some attention). Second, the assimilation (post-adoption) stage of OSM, which assumes the absorption of a particular technology into people's daily routines, has not been studied sufficiently, especially within the context of Saudi Arabia. Third, there is a dearth of OSM research on the risk of OSM usage and its effects of behavioral outcomes within the Saudi context. Therefore, using a large-scale survey, the current cross-sectional study attempts to examine the effect of various apps of OSM assimilation and its association with the development of depression symptoms among users in Saudi Arabia.

2. Literature Review

The literature suggests three major trends in OSM research in the last two decades: (a) adoption of technology issues in OSM research (e.g., Curras-Perez et al., 2014; Young, 2016), (b) technical specifications of OSM applications and media platforms (e.g., Burmeister, 2009; Krishnan, 2013), and (c) the effects of OSM, where OSM has been considered as a dependent or independent variable (e.g., Hussein, 2016; Munnukka & Järvi, 2014; Talwar et al., 2019). The current study contributes to the third stream, as it aims to measure the impact of OSM assimilations on individuals' levels of depression.

In the literature, OSM has been used as a predictor of many behavioral outcomes from both individual and organizational perspectives. For example, the association between the usage of Facebook by college students and their well-being has been investigated (Kalpidou et al., 2011). The results reveal that, although first-year students show a negative association between emotional and academic adjustment and their number of Facebook friends, the relationship was positively associated among upper-class students. Also, the impact of social media usage on the accessibility of information has been measured (Tajudeen et al., 2017). The results show that OSM usage has a positive relationship with information accessibility. Furthermore, other studies have provided evidence on how OSM usage impacts the behavioral outcomes of adolescents and their social connectivity, self-esteem, and identity development (Shapiro & Margolin, 2014). A negative association between Facebook usage and increased protest activity has also been found (Valenzuela et al., 2012).

As per the scope of this study, several studies on OSM as a predictor of behavioral outcomes in the Middle East were reviewed. For example, the number of hours of Facebook usage was found to have a negative impact on students' desire for interpersonal communication with others (Al-Khaddam, 2013). Another Saudi study suggests that OSM has positive effects on college-level students in Saudi Arabia (Alqahtani, 2016). A survey conducted in the Qassim Province with female students found the effects of OSM on social values to be negative (Hussein, 2016). More recently, OSM has been linked to individuals' levels of depression. The new term "Facebook depression" has been coined by the American Academy of Pediatrics (AAP). According to the AAP, it is expected that young users will develop Facebook depression as a result of following the posts, status updates, and shared photos of their peers. The negative effect of OSM usage on users' psychosocial status is greater for vulnerable people or people with low self-esteem, including adolescents and children (O'Keeffe & Clarke-Pearson, 2011).

A survey of US college students [N=1,787] concluded that OSM usage is significantly associated with increased depression (Lin et al., 2016). The results reveal that higher usage of Facebook leads to higher levels of depression. Another study of US college students [N=361] that compared face-to-face support and Facebook support concluded that face-to-face support lowers depression as compared to Facebook (Wright et al., 2013). A systematic review of empirical studies based on data extracted from prominent academic databases suggests that there is a relationship between OSM and depression and that the factors leading to this relationship are psychological, social, behavioral, and individual (Baker & Algorta, 2016). Action research studying public Facebook profiles from college students [N=250] evaluated personally written text (i.e., status updates). The findings suggest that college students who tend to follow status updates on Facebook develop symptoms of Facebook depression (Moreno et al., 2011). An online survey [N=312] confirmed the association between pathological OSM usage and levels of depression (Young & Rogers, 1998).

A Serbian study investigated the relationship between OSM and the development of depression symptoms among college students [N=160]. The correlation between the time spent on OSM and depression level was statistically significant (Pantic et al., 2012). A systematic review revealed a significant association between OSM and the development of mental health issues, such as depression and Internet addiction (Pantic, 2014). The results of another cross-sectional study [N=336] on the connections between OSM addiction and depression among adolescents indicate that OSM usage is positively correlated with depressive symptoms (Banjanin et al., 2015).

By reviewing the above literature and for the purpose of this research, four observations can be made. First, out of the numerous OSM applications currently in use, Facebook has received the most interest from researchers, followed by Twitter. As to linking OSM with depression, in almost all earlier studies, Facebook is the only platform studied. Nevertheless, other OSM platforms still require more in-depth investigation to understand the phenomena through empirical studies. Second, the assimilation (post-adoption) stage of OSM, which assumes the absorption of a particular technology into the daily routines of people, has not been studied sufficiently, especially within the context of Saudi Arabia. Third, fewer studies have addressed the impact of OSM on behavioral outcomes, with a limited focus on the negative impact that may result from the use of OSM (e.g., Hussein, 2016; Munnukka & Järvi, 2014; Saeri et al., 2014). Nevertheless, there is a need for more empirical research to explore the far-reaching risks and consequences of usage. Fourth, the literature on the use and impact of OSM in Saudi Arabia is very limited (e.g., Aljasir et al., 2012; Alqahtani, 2016; Hussein, 2016; Talwar et al., 2019). As with other countries, Saudi Arabia has its own unique cultural and religious attributes. This suggests that more empirical studies are required to understand how OSM assimilation affects the levels of depression among Saudi users.

3. Conceptual Framework

This research builds on previous research and an analysis of an exploratory (pilot) study to develop the indicators to help measure the effect of OSM on individuals' depression. Figure 1 shows the conceptual model used in this study.

Figure 1: The conceptual model of OSM assimilation's impact on depression
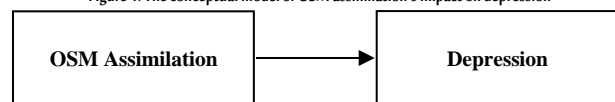
3.1. OSM Assimilation

The literature review indicates that OSM has been measured by three facets: (a) volume of technology, (b) diversity of use (Massetti & Zmud, 1996), and (c) intensity of use (Ravichandran, 2000). OSM volume refers to the total number of OSM apps used by an individual with unique functions and capabilities, such as Twitter, Facebook, YouTube, and Snapchat. OSM diversity is represented by the number of functions for which OSM apps are used. The intensity facet consists of two constructs: the intensity of use and the intensity of integration. The intensity of OSM use represents the extent to which OSM features are utilized for performing/accomplishing each functional area in the diversity facet. The intensity of OSM integration refers to the extent to which OSM has been integrated into the daily activities of users.

3.2. Depression

Depression is identified as a common medical disorder that is negatively associated with the feelings, thinking, and actions of

individuals (American Psychiatric Association, 2019). Depression can cause a variety of physical and emotional issues, including sadness, distress, loss of interest, and decline in ability to perform functions. For this study, a nine-item scale was selected to measure the individuals' levels of depression (Tandoc Jr et al., 2015). Therefore, the hypothesis developed for the study is that OSM assimilation has a negative relationship with individuals' levels of depression.

The current study uses partial least squares (PLS) regression for analysis. It is believed that PLS is not suitable for null hypothesis significance testing, because the parameters' distribution does not follow a normal shape (Henseler et al., 2013). As such, PLS algorithms are routinely used for formal research hypotheses to test relationships (Rigdon, 2013).

4. Research Methodology

The hypothesis of this research is that OSM assimilation influences individuals' levels of depression. To investigate this relationship, a quantitative approach and positivistic philosophy were selected, and a survey research design has been adopted (Collis & Hussey, 2013). In positivistic philosophy, researchers develop research hypotheses derived from either an analysis or synthesis of previous literature and theoretical models. To support preliminary research models, researchers also incorporate direct feedback (qualitative) from social science and industry experts. An appropriate and valid research method can then be designed to test the models. This strategy facilitates the researcher in developing a good theoretical model that can help to explain the research phenomenon.

4.1. Instrument Design

This cross-sectional study adopts a quantitative approach (Mingers, 2003) and used an online survey for data collection. The instrument used for data collection was developed through a review and analysis of the literature in addition to an initial exploratory study. After concluding an analysis of the exploratory study and refining the measurement instrument based on the analysis, a panel of ten experts, which was made up of academicians and practitioners, was invited to evaluate the initial instrument and, if needed, to suggest changes. In addition, before the launch of the large-scale survey phase, the final version of the survey was pilot tested with 10 OSM users to ensure the content validity of the measures.

The final instrument consists of three independent variables: (a) OSM volume, (b) OSM diversity, and (c) OSM Intensity, with depression as the only dependent variable. The first construct, named 'OSM volume' (titled as 'VOL'), was a nine-item, three-point Likert scale measuring the sum of OSM platforms/apps that are used most frequently (Massetti & Zmud, 1996). The item is then transformed into a one-count item. The second construct, named 'OSM Diversity' (titled as 'DIV'), was a nine-item, three-point Likert scale measuring the types of OSM that are used, including (a) Facebook, (b) Twitter, (c) LinkedIn, (d) Snapchat, (e) YouTube, (f) Instagram, (g) Periscope, and (h) WhatsApp, and how frequently they are used (Massetti & Zmud, 1996). This construct has been used and validated in recent studies (Westerman et al., 2016; Zolkepli & Kamarulzaman, 2015). The third construct, named 'OSM Intensity' (titled as 'INT'), was a 12-item, six-point Likert scale measuring the extent to which OSM functions are utilized during daily activities. It covers (a) communication with friends and family, (b) following religious leaders, (c) information seeking, (d) following fashions/trends, (e) entertainment, (f) friendship/companionship, (g) passing time, (h) social interaction, (i) knowledge advancement, (j) relaxation, (k) self-expression, and (l) professional advancement (Ravichandran, 2005).

The only dependent variable, named 'Depression' (titled as 'DEP'), was a nine-item, five-point Likert scale measuring the depression levels of respondents due to OSM usage. It included the following items: (a) "I was bothered by things that usually don't bother me"; (b) "I had trouble keeping my mind on what I was doing"; (c) "I felt that everything I did was not good enough and my life had been a failure"; (d) "I felt fearful about the future"; (e) "My sleep was restless"; (f) "I was happier before using OSM"; (g) "I felt lonely, people were unfriendly"; (h) "I feel that I'm not enjoying life the way I should"; and (i) "I felt that people disliked me" (Tandoc Jr et al., 2015).

4.2. Sampling Design

As to the sample selection criteria, the researcher needs to identify the individuals who are most relevant to OSM assimilations. Since the study is intended to understand the impact of OSM on depression in Saudi Arabia, it was decided to use OSM users as the targeted population. The sample comprised of students enrolled at any institution, as OSM has the highest diffusion among students. Therefore, university and school age students were considered a suitable population for this research. A sample size of over 500 was considered sufficient for the research as per the guidelines given in the literature (Hair et al., 2013).

4.3. Data Collection

The data used for this analysis was imported from an online survey of OSM users in Saudi Arabia. Participants were recruited through popular OSM applications, such as Twitter, Snapchat, LinkedIn, and WhatsApp, and through snowballing techniques with schools and universities from all over the country. First, an online survey was developed using Quesionpro.com, which also included the consent statement. Second, to invite users to participate in the study, an online post with a link to the survey was distributed through different Saudi groups on LinkedIn with thousands of Saudi users. LinkedIn is one of the largest hubs that gathers professional individuals and groups, who would be able to help with the distribution of the survey. Third, a total of 200 schoolteachers and university faculty member listed on LinkedIn from the capital city, Eastern region, and Western region were contacted randomly and asked to distribute the link to their students and encourage them to participate. A total of 849 participants started the survey; however, only 638 successfully completed the survey. After the scrutinizing and cleaning of the data, a total of 626 valid responses qualified for statistical analysis. Table 1 summarizes some of the descriptive data:

Table 1: Individuals' profiles

Education level	Frequency	Percentage
School age	395	63.1%
Undergraduate	165	26.4%
Postgraduate	066	10.5%
Total	626	100%
Age groups		
12–16	243	38.8%
17–22	286	45.7%
23–27	66	10.5%
28+	31	5.0%
Total	626	100%
Gender		
Male	282	45.0%
Female	344	55.0%
Total	626	100%

4.4. Ethical Concerns about Collecting Data from Underage Participants

This study involves the collection of data from participants under the age of 18 and also deals with sensitive individual data. It was, therefore, essential to assure that ethical standards and requirements were met. Most empirical studies involve ethical issues that may pose some risk either to the participants in the study or to the researchers themselves; in some cases, it may extend to include the hosting

institutions of the study.

The important ethical issues include, but are not restricted to, the confidentiality of collected information, anonymity of participants' identity, direct/indirect psychological damage, research's objective dealing with participant feedback, dignity, informed consent, and dissemination of data (Collis & Hussey, 2013).

The current study is sponsored and managed by King Abdulaziz City for Science and Technology (KACST) as part of a national grant and is hosted by the researcher's institution, Imam Abdulrahman Bin Faisal University (IAU). All studies that involve data collection from people undergo ethical review and approval process. In this regard, researches hosted by IAU are processed through the Institutional Review Board Committee (IRBC). Likewise, researches sponsored and managed by KACST are processed though the National Bioethics Committee (NBC). These committees promote ethical practice in data collection and ensure that the rights of all parties (either affected or could be affected by the data collection process) are protected and their roles and responsibilities in the study are clearly defined.

The data collection procedures and analysis of this study were cleared and approved by KACST and IAU, and precaution procedures were applied by the researcher and were put into place to assure any kind of ethics concerns were addressed.

First, the link to the survey used an age validation step. If a participating student indicates that they are below the age of 18, they are asked to enter their parents' consent number; otherwise, they cannot proceed.

Second, in cases where underage participant students do not have their parents' consent number, they are instructed to contact the person from whom they received the invitation to participate in the survey, either their teacher or a representative of their institution.

Third, the teacher or representative is instructed to obtain a signed consent form from the parents of participating students. The signed consent form indicates the approval of parents for their dependents to participate in the study. The consent form defines the role and responsibilities of participants and guarantees the confidentiality of data and anonymity of participants.

Fourth, once a signed consent form is received from the parents, the researcher of the study issues a unique parents' consent number, which allows the student to complete the survey. The consent number is sent to the teacher or representative, who will then share it with the student.

4.5. Data Modeling Software

This research uses the PLS approach (Lohmöller, 1989; Wold, 1982) for data testing. In the literature, the PLS method is widely accepted among social science researchers (Gaskin et al., 2014; Urbach & Ahlemann, 2010). The PLS approach is a second-generation modelling method that facilitates the evaluation of the measurement of research constructs and also the evaluation of the interrelationships between the constructs of research models (Fornell, 1982). These features have promoted PLS to be most suitable for developing and testing theoretical models (Fornell, 1982; Bontis et al., 2002). In this research, the software SmartPLS (Ringle et al., 2005) was employed to perform the PLS analysis.

5. Data Analysis

In PLS analysis, it is necessary to perform two sequential stages of analysis to assess the research model structure, which are measurement model assessment and structural model assessment. SmartPLS was employed for this analysis (Ringle et al., 2005).

5.1. Measurement Model

Reflective measurement models can be assessed through performing a reliability and discriminant validity test (Urbach & Ahlemann, 2010). To this end, the current study follows the measurement model test criteria that are suggested by Henseler et al. (2009).

5.1.1. Unidimensionality

The reliability test is conducted through an internal consistency and unidimensionality check. The unidimensionality test is conducted through the exploratory factor analysis (EFA) test (Hair et al., 2010). Prior to performing EFA, two suitability tests were conducted (Lewis et al., 2005). The result of the Kaiser-Meyer-Olkin (KMO) test was 0.945 (greater than 0.5). The result of Barlett's test, which is shown in Table 2, reveals a significance level of 0.000. Both results indicate that the data is suitable for the EFA test.

Table 2: KMO and Bartlett's tests

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.945
Bartlett's Test of Sphericity	Approx. Chi-Square	1542.828
	df	21
	Sig.	0.000

Principal component analysis (PCA) was used as an extraction method with an Eigen value of 1.0 and using Varimax rotation (loading set at 0.5). A total of three measurement items had to be removed due to their low communalities and low loadings scores (VOL1, DEP1, and DEP2). To assure unidimensionality, measurement items with factor loadings above 0.5 were kept, which is valid evidence that the measurement items share sufficient variance with their respective constructs.

5.1.2. Internal Consistency

The internal consistency in PLS can be accomplished through testing reliability, convergent validity, and discriminant validity (Straub et al., 2004). To satisfy the reliability test, the value of Cronbach's alpha and composite reliability is assumed to be greater than 0.7 (the bottom line is 0.6). Convergent validity helps researchers to measure the extent to which an item of the same construct correlates with each other (Straub et al., 2004). Convergent validity can be satisfied by keeping items with factor loadings > 0.7, average variance extracted (AVE) > 0.5, and communalities value > 0.5. Another item (DEP6) was removed due to low factor loadings. A summary of results, which is shown in Table 3, indicates that the requirements for the reliability and convergent validity tests were satisfied.

Table 3: Psychometric properties of research variables

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	Factors	Original Sample (O)	T Statistics	P Values
OSM Assimil-ation	0.603	0.834	0.716	DIVE	0.856	14.259	0.000
				INTE	0.836	8.932	0.000
Depression	0.830	0.875	0.540	DEP3	0.809	22.462	0.000
				DEP4	0.723	14.659	0.000
				DEP5	0.664	9.329	0.000
				DEP7	0.715	12.988	0.000
				DEP8	0.715	14.658	0.000
				DEP9	0.774	18.252	0.000

The discriminant validity test can guarantee that the various constructs used in the measurement instruments are distinct from each other in the inter-construct correlations table (Straub et al., 2004). This can be satisfied when the values of the square root of the AVE are greater than any corresponding value in the inter-construct correlations (Fornell–Larcker criterion). In addition, the loading values of each item in the matrix of cross-loadings and loadings tables should be greater than all of the corresponding cross-loadings items in the matrix (Chin, 1998; Fornell & Larcker, 1981). The results in Table 4 indicate that the requirements for the discriminant validity test were satisfied.

Table 4: Correlations among major constructs

	Depression	OSM Assimilation
Depression	0.735	
OSM Assimilation	0.161	0.846

5.2. Structural Model

The structural model can be assessed through the extracts of coefficients of determination (R^2) and the path coefficients (Henseler et al., 2009). The results are shown in Figure 2 and Table 5.

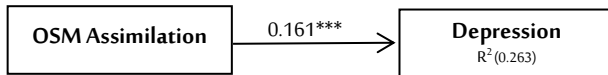**Figure 2: The effect of OSM assimilation on depression**

Table 5: The results of the hypothesis test

Path	Beta	T Statistics	P Values	
OSM Assimilation -> Depression	0.161	4.185	0.000	**Supported**

p<0.05*; p<0.01**; p<0.001*** (significance values are in BOLD)

6. Findings

This research measured the impact of OSM assimilation on individuals' levels of depression in Saudi Arabia. The study attempted to understand how Saudi OSM users make use of OSM as a global trend and how it shapes their behavioral intercourse. A mixed method approach, which included the review literature, a pilot study, and a large-scale survey, was used for (a) identifying and validating the constructs of the conceptual model and for (b) empirically testing the hypothesis for the impact of OSM assimilation on individuals' levels of depression in the Saudi Arabia. The results indicate that the research model has moderate explanatory power for OSM risk (depression) ($R^2=0.26$). The hypothesis test shows that OSM assimilation is associated with depression at a significant level (p<0.001), and thus the hypothesis is supported. Based on statistical analysis and empirical evidence, this finding demonstrates that the excessive use of OSM facilitates the development of depression symptoms and negatively impacts personal behavior. This finding is consistent with findings in the literature (e.g., Baker & Algorta, 2016; Lin et al., 2016; Wright et al., 2013), which confirm the association between OSM usage and the development of depression among users.

The results of this study are an early warning for the expected rise in risk from such phenomena, which could alter Saudi culture rapidly, especially for younger generations. Therefore, the study recommends that regulatory bodies, not-for-profit organizations, and educational and research institutions collaborate to minimize the negative impact of OSM technology. An analysis of OSM usage shows two important aspects. First, the most common reason for using OSM is friendship/companionship or communication with family and friends. This indicates that OSM operates as a means of communication and could be placed on Maslow's hierarchy of needs among belongingness and love needs. Second, based on empirical evidence, the study has demonstrated that OSM usage influences depression behavior. Depression is known for its negative effects on users and their lives. Implicitly, it is reflecting that, as OSM usage increase, depression and envy behavior (and consequent accidents) also increase in society. These are alarming findings as these effects could lead to other family and social consequences. For example, the increase of depression and envy behavior could create health and mental problems for users. The increasing prevalence of selfies and displays of proud and happy moments and good times such as travelling, shopping, and partying adds pressure on people and makes them unappreciative of their own lifestyle. Although these habits are a global phenomenon, some awareness-raising efforts needs to be done by the society to eliminate these multidimensional effects. In addition, they could have far-reaching consequences on the structure and wealth of families, adding more pressure on their financial resources and liabilities.

7. Discussion

The study has demonstrated through empirical evidence that OSM usage influences depression behavior among individuals. Depression behavior produces negative effects on users and their lives and, eventually, on society at large.

The impact of social media on depression can be further classified into four major themes: (a) increased loneliness, unsuitableness, and repugnance, (b) increased fear about the future and failure, (c) increased neuroticism, anxiety, and insomnia, and (d) decreased happiness and enjoyment. First, extensive use of social media increases the loneliness in people's lives, and they feel unwelcome most of the time. For them, other people appear to be unfriendly and to dislike them. Second, OSM usage makes them more fearful about their future and increased dread about failure in life and can reduce their confidence even during successes in life. Third, OSM usage increases anxiety and neuroticism towards trivial issues in life, which could result in more restless sleeps. Finally, and probably most importantly, OSM usage reduces their happiness and enjoyment in life.

8. Limitations

The current study has limitations. The result of this research was based on a survey that was conducted online, which is subject to limitations due to respondents' mistrust of online methodology, which could result in a lower response rate. This situation was anticipated beforehand, and many steps were taken to increase the response rate. First, the online survey was developed using Questionpro.com, which included the consent statement. Second, to invite users to participate in the study, an online post with a link to the survey was distributed through different Saudi groups in LinkedIn (with thousands of Saudi users). Third, a total of 200 schoolteachers and university faculty members, who were listed on LinkedIn, were contacted randomly and were asked to distribute the link to their students and encourage them to participate. Fourth, an invitation was distributed to hundreds of WhatsApp groups with users from the capital city, eastern region, and western region. Fifth, popular Snapchat users were asked to send out invitations to their followers. A total of 626 participants completed the survey. Another limitation is the fact that some mediating or moderating factors were not covered by this study and they could influence the relationship between OSM assimilation and depression.

9. Implications

This study has demonstrated practical implications on several levels. First, this study suggests that the social media phenomenon can be considered as a new concept that is still evolving and growing in popularity among different groups of social clusters. Due to this conclusion, there are many other unknown effects that may be associated with the use, including adverse effects on individuals' personal attributes and attitudes. Second, this research highlights that social media is so prevalent nowadays that almost everyone has some sort of social media connectivity, either on Facebook, Twitter, WhatsApp, LinkedIn, or Snapchat. Third, this study supports the conclusion that individuals' levels of depression as social and behavioral intercourse can be predicted by OSM usage. Fourth, social media is widely available and growing in its usage, generating a need for cautionary measures to be taken by society in general and parents and teachers in particular. Social media is regarded as one of the most powerful contemporary tools and is expected to continue to play an influential role in society. Thus, it is important that people understand its side effects. With the speedy adoption of social media, especially

among teenagers, more care and counseling by society and its care agencies, activists, not-for-profit institutions, and community associations all are required to play vital role in the effort of providing sufficient awareness campaigns, preventive depression counseling sessions that focus on risks of OSM spreading depression among youngsters. Such efforts should address different segments of Saudi users, including young users, parents, and expert users.

Acknowledgments

Biography

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