Facebook Usage and Mental Health:

An empirical study of role of non-directional social comparisons in the UK

Abstract

The present paper explores the relationship between nature of Facebook usage, non-directional comparisons and depressive syndromes. The extant research on linkage between social media usage and mental health is inconclusive. The paper uses data collected through an online survey of 399 Facebook users in the UK. A Facebook frequency rating scale was developed and validated as a part of the study. The Iowa-Netherlands Comparison Orientation Measure was modified and used to measure social comparison. The depressive syndromes were captured by the modified Center for Epidemiological Studies Depression Scale. The Rank Theory of Depression was used a guiding framework. The data collection had focused on the 20-29 year olds, as justified by the literature. The study found a negative relationship between active Facebook use and non-directional social comparisons. The relationship was reversed in the case of passive usage. There is small but significant causal linkage between increased non-directional social comparisons and depressive symptoms among the users.

Keywords: Non-Directional Social Comparison, Facebook usage; Depressive Symptoms; Mental Health; Social Media Platforms.

Introduction

In 1954 the German philosopher Martin Heidegger said, "everywhere we remain un-free and chained to technology" (Heidegger and Lovitt, 1977). Amazingly although he spoke over 60 years ago and technology has advanced dramatically since, this statement is perhaps even more pertinent to today's society. There has been a huge upsurge in portable devices which has meant that many users have become "chained" to their technology, feeling the need to constantly check it for updates. These portable devices have also adapted the way we communicate with one another, facilitated by the new channels like social media platforms. In fact, the rise in these new communication platforms has greatly impacted the quantum of offline interactions, so much so that 57% of people now converse more with their friends online than they do in real life

(Conrad, 2012). On an average, adult population in the developed world spent half of their every day on some form of media including the social media platforms (Nielsen, 2018). Businesses all over the world are actively engaging with the customers through various social media platforms (Kapoor et al., 2018; Rathore, Kar and Ilavarasan, 2017). The research domain is witnessing increasing number of studies (refer for a detailed review, Kapoor et al., 2018; Shiau, Dwivedi and Yang, 2017) that are examining the role played by the social media platforms in businesses, especially in marketing (Alalwan et al., 2017; Dwivedi et al.,2015), and society.

One social media site that has outlasted many others to become the second most visited website worldwide is, Facebook (Conrad, 2012); only being surpassed by Google in the number one slot. 68% of the US adults are Facebook users (Pew Internet Center, 2018). No wonder, Facebook has been much studied platform among the others (for a review please see, Shiau, Dwivedi and Lai, 2018).

Facebook is a Web 2.0 based platform that allows users to create their own profiles, on which they can post photos, videos and status updates whilst also being able to view and comment on other users' uploads. Over 30 billion pieces of content are shared on the site each month; it has therefore created the largest database for social information (Krasanova et al., 2013; Statista, 2017). Users tend to repeatedly check on the status of their and others updates. It is said that an average 20-29 year old spends at least two hours a day on Facebook (Hogenboom, 2018; Conrad, 2012). Facebook provides several numeric popularity measures. Users are able to like, comment or share any other users content, these posts are then displayed in a "News Feed" for all of the user's friends to see. This co-creation and constant engagement with the content have made Facebook and other similar social networking sites as indispensable part of

business strategies. The main themes in the user generated content in the platforms can be influenced by the marketing firms (Aswani et al., 2018). The origin of the advertisement content seen in social media platforms - associate reference group, aspirational reference group and marketer have differential impact on the consumer perceptions of the advertising value (Akhter et al., 2017). When users participate in the platform communities, their participation motivations positively influence customer participation, which in turn significantly affects brand trust and brand loyalty (Kamboj et al., 2018).

The News Feed also allows users to easily compare how many likes or comments their content received to that of their friends. Facebook also has an instant messenger service, this function allows users to see when their friends were last on the site, but this can lead to them speculating if they were ignoring their updates or messages (Blease, 2015). This kind of content has given a greater insight into one's "friends" lives than ever before and has therefore also provided the stimulus to compare own lives to those around. This comparison has been long speculated to have negative implications on the mental health (for instance, Hogenboom, 2018). For example, a person may log onto Facebook and experience envy (Tandoc, Ferrucci, and Duffy, 2015) after looking friends' posted photos of an exotic holiday, or a single person may feel lonely after viewing other users' engagement or wedding status updates.

Comparing to those around or "social comparison", as it is more commonly known, is not a new phenomenon, in fact it was first proposed by Leon Festinger over 60 years ago. Although comparing ourselves to those around is part of establishing social norms and evaluating individual's standing in the society, it is also detrimental to the mental health of human beings. The impact on mental health could happen in two ways. In upward social

comparison, the user compares herself to the people whom she believed to be socially superior. The downward social comparison happens with the people who perceived to be socially inferior. The extant research indicates that the frequency of social comparisons rather than the direction has the highest impact on the mental wellbeing (White et al, 2006). The present paper focuses on the relationship between non-directional social comparisons and depressive symptoms, as opposed to a specific direction.

There has been a substantial rise in the depression related illnesses worldwide (Dhir et al., 2018). According to the World Health Organisation (WHO) depression is now the biggest global health problem, following an 18% overall growth in diagnosis in the last 10 years (Roberts, 2017). There has also been a dramatic increase in the number of depression related deaths. In the UK alone, deaths attributed to mental health issues have risen by 50% in the last three years (Forster, 2017). This increase has been most notable amongst the 20-29 years age category (Jelenchick, Eickhoff and Moreno, 2012). According to the latest survey results, British millennial's have the second worst mental well-being in the world only behind the Japanese (Pells, 2017). This age group, 20-29 years, is of greater importance to be studied. Among various possible reasons, addiction to social media could be one of the factors impacting their mental stability. The increase in use of social media is strongly coinciding with the increase in mental health issues (especially amongst the millennial generation). The recent Blue Whale game played in the social media platforms led many young people to commit suicide (Scott, 2018), clearly indicating the intensity of influence. A study (Kramer, Gullory and Hancock, 2014) sponsored by the Facebook showed that emotion contagion can happen without direct interaction with people through electronic platforms. There are adequate research that demonstrate that social media can be useful in determining consumer behaviour (for instance, Nisar, Prabhakar, and Patil, 2018).

The depression is not just a health issue, but has wider implications. It is thought to be the reason behind one fifth of all work absenteeism in the world. It is also estimated that for every $1 invested in treatment for depression, the economic return is $4 (Roberts, 2017). The relationship between social media platforms and mental health has already attracted a multitude of research (Grover, Kar, and Davies, 2018). There are attempts, as detailed in the following sections, to examine the links between social comparison and depression. The present study aims to unravel the linkage between the nature of Facebook usage, social comparisons and mental health.

The paper is divided into six sections. The first section introduced the objective of the study and the context. The second section provides a literature survey on the concepts used in the paper. It also presents the Rank Theory of Depression. The third section shares the methodology used by the study. The fourth section discusses the study's empirical findings. The fifth section discusses the findings in the light of the literature and implications. The final section concludes the paper with suggestions for the future research.

Literature Review

Social comparison and the rank theory of depression

The National Institute of Mental Health (NHS) describes depression as common but a serious mood disorder prevailing in the world. The mental depression affects how one feels, thinks, and handles daily activities (NHS, 2016). The extreme conditions will result in people committing suicide or injuring others. There are many different theories that can explain the causes of depression, including genetic reasons. For example, Lakdawalla et al., (2007) discusses three theories of depression: Beck's theory, Hopelessness theory, and the Response Styles theory. According to Beck's theory some people would

have continuous negative thoughts about self, world and the future. These negative thoughts leads to developing negative self-schema which results in logical errors in thinking. The undesirable outcomes out of logical errors contribute to the negative thoughts. This results in depression state for those individuals. Seligman explained depression in terms of learned helplessness wherein individuals perceive that attempts to escape negative situations do not make any difference. These perceptions develop due to contextual environment or attributional style (Liu et al., 2015). Response styles theory is about ruminating about the symptoms of depression and possible consequences which aggravates the depression conditions. A detailed discussion of these theories is beyond the scope of the paper. The paper narrows down to a theory that involves social comparison and depression, so that role of social media usage can be examined.

For the purpose of this research, the Rank Theory of Depression is chosen. The Rank Theory of Depression describes how the loss of rank and or the loss of confidence in regaining one's prior rank, can lead to an increased vulnerability to developing depression among people (Sloman et al, 2003). In order to assess the rank one must compare ourselves to those around. Both the nature and the impact of the comparisons could lead to lifestyle change, job loss or a relationship breakdown.

Social comparison online and offline

Individuals compare themselves to those around deliberately or inadvertently. These comparisons results in developing the self-awareness (Suls et al, 2002). Leon Festinger's theory stated that in the absence of an objective measure, individuals routinely compare themselves to others in order to help evaluate their own lives (Steers et al, 2014). People are most likely to compare to those whom they deem similar and join online communities (Festinger, 1954; Hajli, 2014).

The similarity is based on several factors including, but not limited to: height, age, weight, upbringing, education level or income.

Social comparison can be used to estimate one's past and present social standings as well as predicting the future prospects (Suls et al, 2002). Social comparisons can be broken into major categories. Upward social comparison is when people compare themselves to those believed to be superior in some way, and downward social comparison involves comparing to someone who is believed to be inferior. For people, the main focus of all social comparisons is to evaluate themselves. If an objective measure is unavailable, these comparisons can be detrimental to the mental health (White, 2006). Festinger's original theory and subsequent research imply that downward social comparison could lead to an increase in positive emotions, whereas upward social comparison could cause an upsurge in negative emotions (Wheeler and Miyake, 1992). This is supported by Will's "Downward Comparison Theory" which discusses how the use of strategic downward comparison can be beneficial to the individuals. The encouragement of strategic downward comparisons is often used by clinicians and doctors as a therapy tool for patients (Suls et al, 2002). However, downward social comparison has also been known to lead to increased rumination, which can be associated with a rise in depressive symptoms (Feinstein et al, 2013).

The extant research (White et al, 2006) also indicate that frequency of social comparison has the greatest impact on the person's emotions rather than the direction in which they compare (White et al, 2006). Although the older research on social comparison are in the context of face-to-face interactions, social media has now created an online platform in which these social comparisons can occur. It is shown that motivations, goals and interests of people remain consistent regardless of the status, online or offline (Mckenna and Bargh, 2000). Thus, it can be assumed that people would compare themselves to

others in Facebook similar to offline human interactions (Gross and Acquisti, 2005; Steers et al, 2014).

Facebook and depression

There are attempts to explore the relationship between Facebook use and increase in depressive symptoms. A thorough literature review of Facebook (Shiau, Dwivedi and Lai, 2018) found social impact is one of the top areas studied by the earlier researchers. A study (Zuo, 2014) concluded that those who spent longer on the site often felt like their Facebook friends were happier than they were. Chou and Edge (2012) found positive correlations between the amount of time spent on Facebook and the likelihood they were to perceive their life as unfair. In order to gain a greater understanding into why Facebook use may be detrimental to mental health, it is important to look at the primary reasons behind Facebook use. Nadkarni and Hofmann (2012) proposed the two main reasons for Facebook use were "the need to belong" and "the need for self-presentation." There is overall positive bias in representing one online. Panger (2015) had concluded that the primary aspiration for users to use Facebook is to present themselves in a positive light to the external world. The users also experience Facebook envy (Tandoc, Ferruci and Duffy, 2015) when their social attractiveness is perceived to be lower than others and feel subordinated. This envy seems to be prominent among the college students. Users only portraying their lives online as positive have been contributing to loneliness of people those going through internal struggles (Jordan et al, 2011). The viewing of these positively skewed Facebook profiles triggers feelings of envy, which is turn has been found to have a negative impact on users' life satisfaction (Krasnova et al, 2013). The Facebook users have been found to be most envious of other users' happiness, friends' holidays and their social lives (Krasnova et al, 2013). In the light of above, we could infer that these feelings of envy stemmed from the

social comparisons. Even in the offline environment, studies have concluded that people tend to focus solely on the positive aspects of a person's life, and will consequently underestimate any negative aspects (Mehdizadeh, 2010). This could lead to increased feelings of envy and jealousy which are triggers of depressive symptoms (Krasanova et al, 2013). Addition of social media platforms to the offline world would accentuate the processes.

Users only posting positive aspects of their lives online, means people's views Facebook friends might be distorted, resulting in unreasonable negative comparisons with their own lives (Steers et al, 2014). This is further intensified while comparing with those who are befriended exclusively online and have only their online profiles for comparison. Simply using Facebook is not the only way the website has been found to increase cognitive and emotional responses amongst its' users. According to Bevan et al (2012), "unfriending" on Facebook can be also viewed as a form of "relationship termination". Similarly, Kuyken et al (1992) found that unfriending is one of the factors known to trigger depressive symptoms. They found that being "unfriended" lead to an increase in both rumination and negative emotions, both of which are viewed as symptoms of depression (Bevan et al, 2012).

In terms of the Rank Theory of Depression, Facebook provides several different ways in which users may feel that their rank has been compromised. For example, they may feel that their rank has lowered if they messaged a friend and they did not respond, or if they posted a photo that did not receive as many likes as a photo they previously posted. However, there are studies that show that Facebook could be actually be beneficial. Facebook groups allow individuals those with low self-esteem to find people with similar interests and make social connections (Ellison et al, 2007; Kim and Lee, 2011). The groups might be beneficial to those who are making a lifestyle change and suffer social anxiety (Zuo, 2014). Interestingly, the positive effects of social media are more

likely to be felt by older people than their younger counterparts in the context of an university (Jung, Pawlowski, & Kim, 2017; Kalpidou et al, 2011). Some studies have concluded that the relationship between Facebook use and depressive symptoms is curvilinear (Daniels, 2014) - for different levels of Facebook use, the depressive symptoms may differ in directions (Daniels, 2014). This may be a reflection of the different kinds of user interactions possible on the Facebook. For example, if users are actively using Facebook to keep in contact with friends they could have lower depressive symptoms, than someone who uses Facebook to simply view other's profiles.

Though there are adequate claims about causal linkage between Facebook and other social media platforms, the field is not without naysayers. For instance, using an empirical study, Jelenchick, Eickhoff and Moreno (2012) refuted all claims that linked social networking sites usage and clinical depression. Systematic reviews, reviews based on a rigorous and replicable review methodology, do not clearly conclude that Facebook usage leads to depression. Seabrook, Kern and Rickard (2016) reported mixed findings can had called for a non self-reported studies. A narrative systematic review by Frost and Rickwood (2017) found that Facebook use could be associated with addiction, anxiety, depression body image and alcohol use. However, the causality of the relationship was yet to be ascertained. In fact, the authors suggested quantitative meta-analysis to find and conclude about the quantity and nature of relationship. In an email for a magazine (Lorman, 2017), the authors had highlighted the intensity of usage, which the present papers attempts to explore. To quote:

"For example, does passive use of Facebook (e.g., browsing Facebook friend's profiles) explain why some individuals feel depressed after using Facebook compared to those who engage in active use (e.g., posting a message on their timeline)?"

The different types of Facebook use

Facebook use can be broken down into two categories: "Active" and "Passive" (Frsion and Eggermont, 2015). Active Facebook use involves constant interactions between the users and their friends in the platforms, such as posting a status or using Facebook messenger. Passive Facebook use means when users are viewing the content but not interacting with others (Frison and Eggermont, 2015). Earlier research has shown that the frequency of active Facebook use tends to decrease as age increases, whereas passive use increases to a certain extent with age. Millennials subsequently appear to use Facebook for more passive than teenagers who are more active (Pempek et al, 2009, Tobin et al, 2014, and Verduyn et al, 2015). The reasons behind passive vs. active use of social networking sites have also been explored. When asked why they did not actively use social media, two main reasons emerged – lack of comfort in posting own content and no perception of need (Preece et al, 2004).

Not all results from the existing research are pointing towards same direction. Some research shows that passive Facebook use could have the same benefits as the social comparison. Social comparison has been also known to establish positive cognitive effects on its users, as it can help to reduce ambiguity and provide social norms in which we can measure ourselves against (Krasnova et al, 2013). In summation, active Facebook use provides a connection (e.g. conversing with other users) which seems to improve wellbeing (Chiu et al., 2013). This is consistent with social compensation theory (Valenurg and Peter, 2009) which states that those with higher social anxiety may use the internet as a way to interact with peers and therefore lower their feelings of loneliness (Daniels, 2014). Also, disconnecting or passive activities online such as viewing other's profiles,

might lead to increased social comparisons and subsequent negative consequences for the user (Krasnova et al, 2013). Strong links have been found between increased passive social media consumption and an increase in emotions such as "irritability" and "annoyance" (Krasnova et al, 2013) as well as increased feelings of isolation (Burke et al, 2010).

Though there are prior research on social media platforms, focus on Facebook and varying levels of usage and their linkage with the social comparison are limited. Also, we do not know how these social comparisons could lead to an increase in depressive symptoms. The present study attempts to fill the gap.

In the light of above analysis, the study delineated the following hypotheses (presented schematically in Figure 1):

Hypothesis 1. Increased active Facebook use will decrease non-directional social comparisons.

Hypothesis 2. Increased passive Facebook use will increase non-directional social comparisons.

Hypothesis 3. Increased non-directional social comparisons will increase depressive symptoms.

[Insert Figure 1 about here]

Methodology

Sample selection and participants

There are currently 10.7 million (5.3 million females and 5.4 million males) UK Facebook users in the age category of 20-29 years (Statista, 2017), making this the highest number of Facebook users per age demographic for the UK. It is also the age range that has seen the highest increase in depression diagnoses

(Jelenchick, Eickhoff and). Hence, this category is chosen as target population for the study. It will only be possible to generalize the results of this study to this specific demographic "UK Facebook users aged 20-29", not all Facebook users. Nevertheless, the questionnaire could be easily replicated and applied to a different culture or age group. The minimum sample size needed in order to generalize the results to all British Facebook users aged 20-29 is calculated as follows:

Required sample size: $[Z^2 (p) * (1-p)] / C^2$

$Z = 1.96$ for 95% confidence level; $p = 0.5$; c = confidence interval ($0.1 = \pm 10$)

According to equation, the minimum number of respondents required is 96. The study collected data from 399 people. A larger sample reduces the sampling error and enhances generalizability of the study (Field, 2013).

A questionnaire was constructed to measure Facebook use, social comparison and depression syndromes. A pilot study with 10 participants were conducted to test the questionnaire. Some language modifications were made to increase the readability of the questionnaire.

Measuring Facebook use

To measure the type of Facebook use, we have developed a Facebook frequency rating scale (Appendix A). The scale asked the respondents how often they conducted various passive and active Facebook activities. Rather than using vague time-measures such as "very frequently" and "occasionally" that could be interpreted differently by different participants, exact time measures such as "once a day" and "once a week" were used, to increase the criterion validity of the scale.

Measuring social comparison

We have adapted Steers et al.'s Iowa-Netherlands Comparison Orientation Measure (Gibbons and Bunnk, 1999) to measure social comparison on Facebook. The original statement, "I often feel like my friends are happier than

me" was changed to "I often feel like my Facebook friends are happier than me" (Appendix A). The respondents were asked to refer only last month while answering. Using "the last month" as the set time period allowed us to estimate the users' average comparison score better.

Measuring depressive symptoms

In order to accurately measure the participant's depressive symptoms, we had used the Center for Epidemiological Studies Depression Scale (CES-D), (Appendix A). It one of the most prevalent assessment tools that had been deemed accurate in measuring depression by the general medical population (Van Dam and Earleywine, 2011). The CES-D scale covers nine main topics: sadness, loss of interest, appetite, sleep, concentration, worthlessness, fatigue, agitation and suicidal intention (CES-Dr.com, 2017). For the depression symptoms, the respondents were prompted by a statement for which answers pertaining to last two weeks needed to be referred. This is the same time recommended by the NHS and has lowered the creation error (NHS, 2016). The Iowa-Netherlands Comparison Orientation Measure (COM) used a 5-point Likert scale (Malhotra et al, 2012) whereas the CES-D and Facebook used a frequency rating scale. The CES-D scale contains several sensitive questions about self-harm and or suicide which were removed to avoid any potential discomfort to the respondents. The questionnaire was distributed by selecting an initial group of people which are known to fit the criteria, age 20-29 UK Facebook users, and then asked them to distribute it by "sharing it" on their Facebook pages.

   To conduct analysis on the Likert scale questions, each response was given a numerical value (Appendix A) between -1 (strongly disagree) and 5 (strongly agree). These scores were added for each participant to get a "total social comparison score". According to NHS, the CES-D scale questions

should be rated between 0 and 5 (Van Dam and Earleywine, 2011). The Facebook usage questions were categorized into two – active and passive. Each participant was given a score for the amount of "active" time they had spent on Facebook, as well as the amount of "passive" time they had spent on the site. Each response will be given a numerical value between 0 and 6. All questions used a singular direction e.g. "I often feel worse about myself after using Facebook" and "Looking at my friend's Facebook profile's lowers my self-esteem". Therefore the higher the participants total scores in any of the categories the more they had partaken in any of the classifications activities (active Facebook use, passive Facebook use, social comparisons or depressive symptoms). To test Hypothesis 1 and 2, we had conducted multiple regression test to understand how the two-predictor variables (active and passive Facebook use) could predict the outcome variable (social comparisons). To test Hypothesis 3, a linear regression was employed to determine how much a person's depressive symptoms could be predicted by their social comparison scores.

The study did not undertake structural equation mode analysis or mediation analysis by treating social comparisons as mediator between Facebook usage and depression symptoms. Fielder, Schott and Meiser (2011) cautioned treating a variable Z as a mediator in a causal relationship between A and B is one of the four ways to interpret the same inter-correlations. In other words, there could be other mediators in explaining the relationships and other ways interrelationships are present. Nevertheless, this can be treated as a limitation of the study.

Results

The online questionnaire remained active for only two weeks and had received a total of 502 participants. However only 399 participants fitted the age and

Facebook account requirements. The 103 participants that did not fit the requirements were therefore removed from the dataset. The participants' age ranged between 20- 29 years, with the mean age group being 22.7 years. The majority of participants were aged 20-22 years.

An exploratory factor analysis with direct oblimin rotation was performed, to test the internal reliability of the data set. The analysis revealed 4 factors (Table 1). 18 items had loaded onto the 1st Factor, which could be categorized as questions regarding depressive symptoms. 10 items had loaded onto the 2nd Factor that were all about social comparisons. 6 items had loaded onto the 3rd factor, that were related to the active Facebook use. The final factor was of 5 items that were about the passive Facebook use. Three items did not load and were removed - when I am on Facebook I often compare myself with others with respect to what I have accomplished in life; when on Facebook I felt less confident about what I have achieved compared to other people; and When on Facebook I paid a lot of attention to how I do things compared to how others to do things (Appendix A).

To further test the internal reliability, Cronbach's alpha was calculated. All Cronbach's alpha scores were above 0.7, therefore internal reliability of the factors were high and acceptable (Field, 2013). The score for Depressive Symptoms was 0.974 and 0.897 for the Social comparisons.

[Insert Table 1 here]

The relationship between Facebook usage and Social comparisons

The earlier research (Chou and Edge, 2012) had found positive correlation between the time spent on Facebook and its links with social comparison. Pearson's correlation coefficient was calculated to see whether present study produced the same results. The analysis (Table 2) found a small positive correlation between the number of times a user logged into the website and

the amount of non-directional social comparisons that they had made (r=0.36). However, the results were not significant at p>0.05. In other words, the present study did not find any association between the time spent and social comparisons.

[Insert Table 2 about here]

As per the Hypothesis 1, with active Facebook social comparisons would decrease. The Hypothesis 2 stated that as passive Facebook use increased the non-directional social comparisons. A multiple regression analysis was completed to assess if the type of Facebook use forecasted how much a participant compared themselves with their Facebook friends.

The Social comparison scores had ranged between -20 and 20, with a mean score was 6.13. However it had a high standard deviation of ± 9.85. The participant's active Facebook scores were between 3 and 40, with a mean score of 18.68 and a standard deviation of ± 7.94. The passive Facebook scores had ranged from 11 to 24 with a mean of 22.12 with a relatively low standard deviation of ± 2.61.

The multiple Pearsons' correlation coefficients (Table 1) were calculated to find the association between the variables. Hypothesis 1 was supported, as negative correlation was found (r=-0.353) between active Facebook use and social comparisons. The hypothesis 2 was also supported, as there was there was a positive correlation (r= 0.236) between passive Facebook use (PA) and social comparisons. The one-tailed significance of each correlation is below 0.05 and therefore the association is therefore significant (Field, 2013).

The association between active and passive uses of Facebook was negative (r= -0.82). This inferred that the variables were therefore measuring two separate things, making them independent of each other. The F test was highly significant, indicating the linearity of the model (F(2, 96) = 9.679, p <

0.005). We therefore reject the two null hypotheses: "There is no relationship between active Facebook use and non-directional social comparisons" and "There is no relationship between passive Facebook use and non-directional social comparisons."

The regression output (Table 3) showed that the independent variables, Facebook usage types explained 16.8% of the dependent variable, social comparisons. It had an adjusted R^2 of 0.150, which was very close to the original R^2 score (0.168), demonstrating the strength of the model (Fields, 2013). The Durbin Watson score was used to demonstrate the independence of observations in the data set, d= 1.789. As the value was between $1.5 < d < 2.5$, it indicated that there was no auto-correlation in the data set.

The unstandardized coefficients (B values) showed that for one increase in quantity of passive Facebook use by 1 unit, the amount of non-directional social comparisons would increase by 0.789 (Table 3). Whereas, for one increase in quantity of active Facebook use by 1 unit, the amount of non-directional social comparison would decrease by - 4.16. As social comparisons and Facebook use were measured on different scales, standard deviations could be used to compare the beta values. If active Facebook use were to increase by one standard deviation, the non-directional social comparison score would decrease by -0.331 standard deviations. The passive Facebook use were to increase by one standard deviation then the non-directional social comparison score would increase by 0.209 standard deviations. The results were significant, as the p values were under 0.05 (0.028 for active and 0.01 for passive). The t test associated with beta values showed if the predictor was making a significant contribution to the model. The smaller the p value, the larger the value of t the greater contribution to the model. The t-test results indicated that active Facebook usage made a significant contribution in predicting the social comparisons (t (96) = - 3.59, p <0.05). The t-test for passive Facebook use,

indicated that passive Facebook also made a substantial contribution in predicting social comparison (t (96) = 0.209, p< 0.05). The significance values for these results were all below 0.05 indicating the validity of the results.

Non-directional social comparisons and depressive symptoms

According to the Hypothesis 3, non-directional social comparisons predicted the depressive symptoms. A linear regression analysis was conducted to assess whether participant's depressive symptoms score could be predicted from the amount they compare themselves to others.

The F ratio value 12.09 at $p < 0.05$ did not support the null hypothesis, "There is no relationship between non-directional social comparison and depressive symptoms.*"* The association between the variables was weak (r =0.333) (Table 3). The regression model (Table 4) was significant, but had low predictive power (r^2 =0.111, p<0.05). In other words, non-directional social comparison scores could predict only 11.1% of the variation in depressive symptoms scores. For one unit increase of non-directional social comparison scores, the depression scores would rise by 0.146. The t-test shown in Table 3 (T(97) = 3.477, p>0.05), showed that non-directional social comparison scores could make a significant impact on the depressive symptoms.

[Insert Table 3 and 4 about here]

Discussion

The extant research on linkage between Facebook usage and mental health is inconclusive and do not differentiate between active and passive uses. The present study is able to demonstrate that active Facebook leads to lower non-directional social comparisons. On the other hand, passive Facebook usage leads to higher non –directional social comparisons. The non-directional social comparisons lead to depressive symptoms.

The present research differentiated the nature of Facebook usage into active and passive categories. This differential is not present in the earlier research. For instance, Kramer, Gullory and Hancock (2014) differentiated between negative and positive content in the feeds, not the nature of usage. Tandoc, Ferrucci, and Duffy (2015) found that heavy usage of Facebook had resulted in higher envy, subsequently depressive status among the college students. The present student clearly differentiated the nature of usage and contradicted by showing that only passive usage lead to increased social comparison which in turn lead to depressive symptoms. The age category taken for the study, 20-29 years is different from the college students as well.

The present study validated the observations made by Daniels (2014) that users who are actively using Facebook to keep in contact with friends have lower depressive symptoms than someone who uses Facebook to simply view other's profiles. By conducting causal analysis, the present study also refuted the claim bade by Jelenchick, Eickhoff and Moreno (2012) that there was no linkage between Facebook usage and depression among the college students.

Earlier Krasnova et al (2013) contended that social comparison might help people by reducing ambiguity as the benchmarks are provided by the networking sites. The present study deviates from this. However the quantum of linkage, inferred by lower predictive power of the regression model, infer that social comparison can have some positive benefits. In an alternative explanations, Valenurg and Peter (2009) reasoned that people reduce social anxiety by interacting with people online. This may explain the linkage between active Facebook usage and lower social comparisons.

Implications

The present study is the first to differentiate the active and passive uses of Facebook clearly and their linkages with the social comparisons. By operationalizing the social comparisons, it contributed to the extension of social rank theory of depression to the study of social media platforms. By focusing exclusively on the age category of 20-29 years, it brought in

additional insights on usage of Facebook and mental health linkages. The earlier research tend to focus more on the university students. Earlier research highlights the passive usage of older users and did not relate to the depressive symptoms. This research is able to demonstrate the linkages using the empirical data and has contributed to the area of post-adolescent health behaviour.

The findings of the research have implications at three levels: individuals, firms and medical practitioners. The individuals shall benefit from the finding that passive Facebook usage would lead to increase in social comparison which in turn results in depressive symptoms. The passive usage behaviour includes logging into the sites and monitoring others' profiles without any interaction. Over a period of time, this might result in depression. Active Facebook usage will reduce the social comparisons which prevents depression and also helps to handle, as mentioned in the earlier research, to social anxiety.

The business implications can be discussed from two players: platforms and other businesses. The social networking platforms can benefit from the finding by creating additional functions to help the users. The Facebook can signal to the passive users that continuation of such behaviour will eventually lead to depression or mental health issues. Alternatively, it can help users with social anxiety by constantly encouraging them to be an active users of the platform. The social media use by the businesses is extensive, especially in the functions of marketing (Alalwan et al., 2017). The present study infers that the passive users are still using the Facebook to follow other's worlds. An advertisement liked or shared by an active user is still seen by the passive users and interpreted. The firms should think of ways by which passive users can be targeted.

The findings of the present study adds to the knowledge available to the medical practitioners. The linkage between level of usage, active or passive and their linkage to social comparison and depressive symptoms can help in diagnosis and planning treatment strategies, especially to the 20-29 years age category who seem to prone to depression.

Conclusion

The results indicated that passive Facebook use increases non-directional social comparisons whereas active Facebook use decreases the non-directional social comparisons. This research established a small but significant positive relationship between social comparisons and depression symptoms. Given the limitations of time, money and personnel, all academic research have inadequacies. They can be addressed by the future research. Some of them are discussed below.

Limitations and Future research directions

The causes of depression are complex with no common or singular trigger being uniformly recognized (NHS, 2016) and need to be studied further. This study had used only the Rank Theory of Depression showing that social comparison is related to the depressive symptoms. Further research could look at the other theoretical frameworks and related concepts or variables in predicting the depression.

Contrary to the prior research, the association between "number of Facebook logins" and "non-directional social comparisons" was insignificant. This may be due to the fact that number of times that the user logs into the site may not be a true reflection of how long they are actually spending on the site. Many devices now allow users to remain logged into the site, so even if the user spends longer time on the website they might have actually only logged in once. Inconsistency in measuring Facebook usage in prior studies limits the cross comparisons. The operationalization include "frequency of Facebook status updates" (Ong et al, 2011) and "number of logins per day" (Junco, 2013). Future research can attempt to develop and validate Facebook usage scales which can be helpful to the future studies in this area.

Our study required for its participants to report on their own depressive symptoms. Despite the anonymity of the survey, the answers may suffer from

the social desirability bias. It would be insightful to conduct the same survey

with people who have already been clinically diagnosed with depression. Some

sensitive questions in CES-D scale were removed in this study. Using trained

medical professional as part of the study will cover the wide range of

depressive syndromes as well.

The study did not consider demographic characteristics like gender,

religion, marital status, education and other variables. It focused on a specific

age category and assumed the sample to be homogenous. A large scale study

incorporating all possible variables in analysis might bring in additional

insights. The study also did not undertake mediation analysis which might be

possible with a larger sample size and additional factors. Such an analysis

should be attempted by the future studies.

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