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Online Vigilance and Its Relationship to Digital Stress and Symptoms of Depression

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Abstract

The current study aims to identify the nature of the relationship between online vigilance , digital stress and symptoms of depression. Likewise, it detects gender differences in each of online vigilance, digital stress, and symptoms of depression. This is done through a sample of (244) male and female students from regular students in Saudi universities, including (134) males (110) females. The following tools were applied to the study sample: Online Vigilance Scale (Attribute), prepared by: (Reinecke et al, 2018) and Online Vigilance Scale (Status) prepared by (Johannes et al,2020), Arabization: Mohamed Abdul Raouf Abd Rabbo, and Digital Stress Meter (Prepared by (Fisher.R&Riedel,2021) Arabization: Mohamed Abdul Raouf Abd Rabbo, and the Aaron Beck Depression Scale translated by Abdul Sattar Ibrahim. One of the most important results of the study was the existence of a statistically significant correlation between online vigilance and both digital stress and depression symptoms. Also, there were no statistically significant differences between the sexes in each of online vigilance, digital stress, and depression symptoms, and online vigilance contributed to predicting both digital stress and depression symptoms.

Keywords: *Online Vigilance, Digital Stress, Symptoms of Depression*

INTRODUCTION

Online information and communication technology have become an integral part of daily life practices. The use of technology and communications via the Internet has increased with the emergence of the Corona pandemic and the use of many institutions and organizations in the use of new digital technologies and social media applications as basic means of communication, cooperation and accomplishing various tasks.

The excessive use of social media is associated with the term (Online vigilance), which is defined as "a psychological structure that reflects the degree of permanent cognitive orientation of users of mobile smart devices connected to the Internet towards the content circulating on them and towards connecting to them and towards exploiting all options to interact with them continuously." (Reinecke, et al,2018, p.1-2). Online vigilance is a new concept that describes individual differences in users' cognitive orientation to the Internet, their interest and integration into relevant online signals and stimuli, and their prioritization of online communication, and its proponents claim that it is acquired through effective and traditional training processes that form the basis for media use behaviors. (Le Roux, D. B., & Parry, D. A,2022)

Online mindfulness in psychology involves three basic processes in users: 1- their cognitive orientation to constant and online communication. 2- Their chronic interest and constant integration of signals and incentives related to the Internet into their thinking and feeling. 3- Their motivational attitude towards prioritizing online communication options at the expense of other behaviors.

The three previous processes identified for online vigilance can be represented to varying degrees by the dimensions of Internet vigilance. The component of cognitive orientation can be strongly represented particularly strongly by a dimension of Internet vigilance called prominence, which refers to the degree to which users of mobile smart devices connected to the Internet remain cognitively connected to their personal space on them. (Reinecke et al, 2018)

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The component (chronic attention and attention) corresponds strongly to the second dimension of online vigilance, called (interactivity), which refers to the constant tendency to respond to signals and alerts received via the Internet at the expense of environmental requirements not connected to the Internet. As for the component (motivation), it corresponds strongly to the third dimension of online vigilance, called (monitoring), which refers to the constant observation of the smartphone connected to the Internet and the continuous examination of notifications and alerts received via the Internet. (Salem and Naghi, 2024).

Online vigilance contributes to increasing the level of communication burden and digital stress among university students: It gives the student a state of alert and readiness to follow what is happening on the Internet and immediately respond to incoming signals and messages, which causes him to suffer from a state of digital stress as a result of excessive response or receiving knowledge content. (Hefner, D., & Vorderer, P. ,2016; Reinecke, et al., 2018; Freytag et al., 2021)

Digital stress is "an emotional imbalance felt by some when the requirements of dealing with digital technology on the one hand and the personal possibilities available to adapt to it on the other." (Wimmer&Waldeburger,2020, p.1). Online vigilance leads to feelings of digital stress, represented in feelings of distress, anguish, and fatigue resulting from dealing with digital technology. This is confirmed by a study (Gilbert et al,2021) of an association between online vigilance and digital stress.

Digital stress here is of two types. The first type is personal assaults, usually hateful messages from a person such as: "You are ugly" or "I hope you die" or public exposure and humiliation. This is represented in insulting messages about the individual. The second type includes the pressures related to moving closely in relationships before feeling annoyed, and it occurs when someone feels exhausted by someone who sends excessive messages and pressures him to give him requests to access accounts on the Internet or to send messages and break into accounts and digital devices and access them by browsing someone's messages. (Weinstein, E. C., & Selman, R. L., 2016).

Digital stress in adolescence is referred to as an emerging and widespread source of personal stress for this age group and is associated with symptoms of Depression (Nick et al., 2021). The prevalence of depression has been observed to be higher among individuals who use the Internet and social networks excessively compared to others who use less frequently. (Tang, C. S., & Koh, Y. Y. ,2017)) (Lin, et al, 2016). Adolescents are more used than other age groups. (Griths, et al., 2014). Evidence suggests that compulsive overuse of the Internet is rarely beneficial and even has harmful effects on the individual (Andreassen, 2015). Some studies indicate a positive association between Internet addiction and depression such as (Yen et al,2007), (Ha et al, 2007) ,(Orsal et al,2013).

It is not clear so far in the psychological heritage whether depression is the cause or result of Internet addiction and preoccupation and excessive interest in social media. Some escape from problems through excessive interest and preoccupation with the Internet and at the same time, the excessive compulsive use of the Internet leads to negative feelings, mood swings, and depressive symptoms. Therefore, the current study attempts to shed light on the nature of the relationship between Internet alertness, digital stress, and symptoms of depression, and the extent to which Internet vigilance contributes to predicting digital stress and symptoms of depression.

Objectives

- Identify the nature of the relationship between Internet vigilance and both digital stress and depression symptoms among the sample members.

- Detection of gender differences in Internet alertness, digital stress, and symptoms of depression.

- Identify the extent to which Internet vigilance contributes to predicting both digital stress and symptoms of depression.

Hypotheses

- There is a statistically significant correlation between Internet alertness and both digital stress and depression symptoms.

- There are statistically significant differences between males and females in Internet vigilance, digital stress, and symptoms of depression in favor of females.

- Internet vigilance contributes to predicting both digital stress and symptoms of depression.

Study Design and Methodology

The descriptive approach is the method of sample survey, which is the appropriate approach to the objectives of the research. It is concerned with describing what is an object and describing the current phenomenon, its composition, processes, and the prevailing and affecting conditions. The descriptive approach includes data collection, tabulation, analysis, study, measurement, and interpretation, which is an accurate and organized method of the phenomenon or problem to be researched through an objective and honest methodology in order to achieve the objectives of the research.

Participants

The study sample consisted of (244) male and female students from regular students in Saudi universities, of whom (134) males (54.5%), (110) females (45.1%).

Tools

To achieve the objectives of the research, the psychometric properties of the study tools and their suitability for the purposes of the current study have been ascertained, and these tools are as follows:

Personal Data and Demographic Variables Form: Prepared by the research team.

Online vigilance scale: A- Online Vigilance Scale Attribute Prepared by: (Reinecke etal,2018) B- Online Vigilance Scale Status. Prepared by: (Johannes, et al, 2020) Translation : Mohamed Abdul Raouf Abd Rabbo, The scale consists of (16) phrases distributed on three dimensions: the first dimension (prominence) and the number of its phrases (6), the second dimension (interactivity) and the number of its phrases (5), the third dimension (observation) and the number of its phrases (5) as the phrases from (1 to 12) are answered as follows: (not apply, apply, apply to some extent, apply to me a lot, apply to me completely) and the degrees are as follows in order (1, 2, 3, 4, 5) The phrases Numbers (13, 14, 15, 17) so the answer is as follows (absolutely, rarely, little, sometimes, not a little, a lot to some extent, a lot) and the degrees are as follows respectively (1, 2, 3, 4, 5, 6, 7). The validity of the scale was confirmed in the current study using the honesty of internal consistency and the calculation of correlation coefficients between the degree of each phrase and the total degree of the dimension to which it belongs (n = 50). The correlation coefficients ranged between (0.490, 0.768) as well as the correlation coefficients were calculated between the degree of each dimension and the total degree of the scale and the correlation coefficients ranged between (0.901, 0.925) and all of them are a function at (0.01). The stability of the scale was calculated using the Cronbach alpha coefficient and the stability coefficients ranged between (0.860 , 0.886) and the half-fractionation method, and the stability coefficients ranged between (0.726, 0.800), all of which are high stability coefficients.

Digital stress meter :Prepared by (Fisher.R&Riedel,2021)Translation: Mohamed Abd al-Raouf Abd Rabbo. The scale consists of (45) phrases distributed on four dimensions: the first dimension (security and privacy stress) and the number of its phrases (9), the second dimension (role and control stress) and the number of its phrases (11), the third dimension (overload stress) and the number of its phrases (7), the fourth dimension (conflict stress) and the number of its phrases (18), and the answer to the scale is according to the following alternatives: (always, a lot, sometimes, rarely, never) and the degrees are as follows in order (5, 4, 3, 2, 1), and the statements numbers (19, 22, 23, 25, 31) are corrected in the opposite direction. The validity of the scale was confirmed in the current study using the honesty of internal consistency and the calculation of correlation coefficients between the degree of each phrase and the total degree of the dimension to which it belongs (n =

50). The correlation coefficients ranged from between (0.309, 0.717) as well as the correlation coefficients were calculated between the degree of each dimension and the total degree of the scale and the correlation coefficients ranged between (0.882, 0.923) and all of them are a function at (0.01), and the stability of the scale was calculated using the Cronbach alpha coefficient and the stability coefficients ranged between (0.815, 0.885) And the half-fractionation method, and the stability coefficients ranged between (0.632, 0.833), all of which are high stability coefficients.

Beck Depression Scale: Prepared by(Aaron Beck)Translation: Abdul Sattar Ibrahim. The scale consists of (21) item and each item consists of four phrases, and the degree on these phrases is estimated from (zero to 3) and the highest degree that can be obtained by the examinee on the scale (63) degree and the lowest degree that can be obtained by the examiner on the scale is (zero) has been confirmed the sincerity of the scale in the current study using the honesty of internal consistency and the calculation of correlation coefficients between the degree of each item and the total degree of the scale (n = 50) and the correlation coefficients ranged between (0.327, 0.699) All of them are a function at (0.01) and the stability of the scale was calculated using the Cronbach alpha coefficient was the stability coefficient (0.749) and the half-fractionation method was the stability coefficient (0.922) and all of them are high stability coefficients.

Statistical Analysis

The following statistical methods were used: mean and standard deviations, Pearson's correlation coefficient, Cronbach alpha coefficient, T test, and simple regression analysis.

Results

The results of the first hypothesis show that "There is a statistically significant correlation between online vigilance and both digital stress and depressive symptoms." The validity of this hypothesis has been verified as follows:

1- Pearson's correlation coefficient was used to verify the relationship between the dimensions of the online vigilance scale and the dimensions of the digital stress meter.

Table (1) Results of correlation coefficients between the dimensions of the Online Vigilance Scale and the dimensions of the Digital Stress Meter (n=244)

Online Vigilance Scale Dimensions / Digital stress Scale dimensions	Jutting	Interactivity	Monitoring
Security and privacy stress	0.258**	0.186**	0.157**
Role Stress and Control	0.339**	0.310**	0.263**
Overload stress	0.357**	0.339**	0.235**
Stress Conflicts	0.335**	0.294**	0.266**
Total Grade	0.357**	0.310**	0.260**

It is clear from Table (1) that there is a statistically significant positive correlation between the dimensions of the online vigilance Scale and its total score and the dimensions of the digital stress scale and its total score at the level of significance (0.01).

2- Pearson's correlation coefficient was used to verify the relationship between the dimensions of the online vigilance Scale and the Beck Depression Scale.

Table (2) Results of the correlation coefficients between the dimensions of the Online Vigilance Scale and the Beck Depression Scale (n=244)

Dimensions of the Online Vigilance Scale	Beck Depression Scale
Jutting	0.296**
Interactivity	0.303**
Monitoring	0.216**
Total Grade	0.298**

It is clear from Table (2) that there is a statistically significant positive correlation between the dimensions of the online vigilance Scale and its overall score and the Beck Depression Scale at the level of significance (0.01).

The results of the second hypothesis show that "there are statistically significant differences between males and females in online vigilance, digital stress, and symptoms of depression in favor of females." The validity of this hypothesis has been verified as follows:

1- The differences between males and females were calculated on the online vigilance scale using the "T" test and the results were as follows:

Table (3) shows the differences between (males - females) on the online vigilance scale (n = 244)

Significance level	Value of t	Females (n=110)		Males (n=134)		Dimensions of the Online Vigilance Scale
		Standard deviation	Average	Standard deviation	Average	
0.222	0.151	5.733	15.536	6.307	15.654	Jutting
0.132	-0.111	4.553	13.145	5.202	13.075	Interactivity
0.562	1.003	4.704	12.345	5.140	12.985	Monitoring
0.121	0.366	13.505	41.027	15.405	41.714	Total Grade

It is clear from Table (3) that there were no statistically significant differences between the average scores of the sample members on the dimensions of the online vigilance Scale and the total score attributed to gender (male and female) in all dimensions of the scale.

2- The differences between males and females were calculated on the digital stress scale using the "T" test and the results were as follows:

Table (4) shows the differences between (males - females) on the numerical stress scale (n = 244)

Significance level	Value of t	Females (n=110)		Males (n=134)		Dimensions of Digital Stress Scale
		Standard deviation	Average	Standard deviation	Average	
0.992	1.686	7.135	22.481	7.429	24.067	Security and privacy stress
0.804	0.939	7.280	30.127	7.495	31.022	Role Stress and Control
0.499	0.345	4.392	19.972	4.881	20.180	Overload stress
0.847	1.343	9.820	50.063	10.171	51.797	Stress Conflicts
0.637	1.301	25.327	122.645	27.214	127.067	Total Grade

It is clear from Table (4) that there are no statistically significant differences between the averages of the scores of the sample members on the dimensions of the digital stress scale and the total score attributed to gender (male and female) in all dimensions of the scale.

3- The differences between males and females were calculated on the Beck Depression Scale using the "T" test and the results were as follows:

Table (5) shows the differences between (males - females) on the Beck Depression Scale (n=244)

Significance level	Value of t	Non-female (n=110)		Males (n=134)		Beck Depression Scale
		Standard deviation	Average	Standard deviation	Average	
0.825	-3.286	10.40852	16.4182	10.12694	12.0752	

It is clear from Table (5) that there were no statistically significant differences between the average scores of the sample members on the Beck Depression Scale attributed to gender (male and female).

The results of the third hypothesis: which states that "online vigilance contributes to predicting both digital stress and symptoms of depression" and the validity of this hypothesis was verified as follows:

1- The simple linear regression coefficient was used to verify the extent to which digital stress can be predicted through online vigilance.

Table (6) shows the values of the multiple correlation coefficient, its square, the value of variance and its significance to ensure the validity of the model to predict the total degree of digital stress (n = 244)

Significance level F	F	Coefficient of determination (R2)	Multiple correlation coefficient ®	Number	Dependent variable	Predictor independent variable
0.000	31.86	0.116	0.341	244	Digital Stress	online vigilance

It is clear from Table (6) that the prediction is statistically significant, in the sense of the ability of the independent variable (online vigilance) to predict the dependent variable (digital stress) in the study sample, where the value of (F) was statistically significant at the level of significance (0.01) and this indicates the significance of the prediction model.

Through the value of the coefficient of determination (R2), it turns out that the percentage of the contribution of the independent variable to the prediction of the dependent variable (11.6%)

The following table shows the ability of the independent variable (online vigilance) to predict the total degree of digital stress among the study sample members by reviewing the values of the regression coefficient, beta, t, and significance level.

Table (7) shows the results of the regression analysis (regression coefficient - beta - T) to test the predictive power of online vigilance with the total degree of digital stress

Significance level T	T	Beta	Regression coefficient	Predictor variable	Dependent variable
0.000	20.842	-	99.617	Regression constant	Digital Stress
0.000	5.645	0.341	0.616	Online vigilance	

It is clear from Table (7) that the value of (T) came statistically significant at the level of significance (0.01) and this indicates that the independent variable (online vigilance) contributed statistically significantly to the interpretation of the percentage of variation in the dependent variable (digital stress) in the study sample.

2- The simple linear regression coefficient was used to verify the extent to which depression symptoms can be predicted through online vigilance.

Table (8) shows the values of the multiple correlation coefficient, its square, the value of variance, and its significance to ensure the validity of the model to predict the total degree of depressive symptoms (n = 244)

Significance level F	F	Coefficient of determination (R2)	Multiple correlation coefficient ®	Number	Dependent variable	Predictor independent variable
0.000	23.636	0.098	0.298	244	Purposes of depression	online vigilance

It is clear from Table (8) that the prediction is statistically significant, in the sense of the ability of the independent variable (online vigilance) to predict the dependent variable (Symptoms of depression) in the study

sample, where the value of (F) was statistically significant at the level of significance (0.01) and this indicates the significance of the prediction model.

Through the value of the coefficient of determination (r2), it is shown that the percentage of the contribution of the independent variable in predicting the dependent variable (9.8%)

The following table shows the ability of the independent variable (online vigilance) to predict the total degree of depressive symptoms among the study sample by reviewing the values of the regression coefficient, beta, T, and significance level.

Table (9) shows the results of the regression analysis (regression coefficient - beta - T) to test the predictive power of online vigilance with the total degree of symptoms of depression

Significance level T	T	Beta	Regression coefficient	Predictor variable	Dependent variable
0.008	2.686	-	5.172	Regression constant	Symptoms of depression
0.000	4.862	0.298	0.214	online vigilance	

It is clear from Table (9) that the values of (T) were statistically significant at the level of significance (0.01) and this indicates that the independent variable (online vigilance) contributed statistically significantly to the interpretation of the percentage of variation in the dependent variable (depression symptoms) in the study sample.

DISCUSSION

It is clear from Table (1) that there is a statistically significant correlation between online vigilance and digital stress, and this is consistent to some extent with the study of: (Gilbert et al,2021)) Carolus et al., 2019) (Freytag et al., 2021) (Hall et al., 2021). The explanation for this is that Internet users face a challenge in receiving a staggering amount of information and requests for communication via the Internet, and these requests from ICT may exceed users' cognitive resources and thus can be associated with great stress and stress (Wilmer et al,2017). When the communication load – the number of messages sent and received – increases to a certain extent and these messages can no longer be processed properly or other situational demands (such as related tasks) can no longer be adequately met, digital stress can occur (Reinecke et al,2017).

It is clear from Table (2) that there is a statistically significant correlation between online vigilance and symptoms of depression. Within the limits of the researcher's knowledge, there are no previous studies that dealt with the relationship between online vigilance and depression symptoms directly, but there are many studies that have confirmed the existence of a significant correlation between Internet addiction and depression, such as: (Yen et al, 2007) (Orsal et al,2013) (Li et al,2018). As Internet addiction or excessive use of the Internet reduces the interaction of the individual with those around him in real life such as friends, family and others, and this makes the individual live in isolation and gradually become an introverted person with a nervous mood that tends to indifference and neglect in his work and shows depressive symptoms, and the relationship of online vigilance with symptoms of depression can be explained by what a study indicated (Van Deursen et al. 2015) pointed out that the high level of online vigilance may be a cause of an individual's maladjustment and depression and that the individual's failure is directly related to the overuse of Internet-connected technology. online vigilance is a psychological structure that reflects the degree of permanent cognitive orientation of users of mobile smart devices connected to the Internet towards the content circulating on them and towards contacting them and towards exploiting all options to interact with them continuously (Reinecke, et al,2018) online vigilance here includes a state of continuity and permanent cognitive orientation to interact with devices associated with the Internet and excessive use of the Internet, and based on what the results of many previous studies indicated of the existence of a correlation between Internet addiction and excessive use of it and depression, this confirms and supports the fact that there is a statistically significant correlation between online vigilance and symptoms of depression.

It is clear from Table (3) that there are no statistically significant differences between the average scores of the sample members on the dimensions of the online vigilance scale and the total score attributed to gender (male/female) and this is consistent with the study of: (Reinecke et al, 2018) (Johannes et al.2018) (Johannes et al.2020) Le Roux et al,2021) In the current era, as it is called the time of the Internet, there has become an excessive passion and interest among both males and females for mobile smartphones connected to the Internet and the attempt of each of them to vent by preoccupation with Internet activities and respond to their constant alerts and notifications in order to compensate for the lack of direct social interactions and satisfy their desires and tendencies.

It is clear from Table (4) that there are no statistically significant differences between the averages of the scores of the sample members on the dimensions of the digital stress scale and the total score attributed to the gender (male / female) and this is consistent with the study of: (Wrede et al, 2021) (Nick et al, 2022) (Gilbert et al, 2021) (Mohamed and cellular, 2022) This is due to the existence of equal opportunities for both sexes in accessing digital applications, their proficiency in technology skills, and their excessive preoccupation with the Internet and social media, which led to no significant gender differences in the level of digital stress.

It is clear from Table (5) that there are no statistically significant differences between the average scores of the sample members on the depression scale attributed to the gender (male / female) and this is consistent with the study of: (Tuisku et al, 2009) (Scimeca et al, 2014) (Yang et al, 2017) (Song et al, 2020) Students at this stage, whether males or females, are exposed to the same pressures, challenges, responsibilities, burdens and problems, even if their sources differ, and as a result of these factors, they may not find a way through which they express their psychological suffering, so they become depressed people and feel sad, pessimistic and guilty sometimes, and their mood changes and they go through times when their self-confidence fades.

It is clear from Table (6), (7) (8), (9) that online vigilance contributed to predicting digital stress and symptoms of depression. This can be explained in the case of active use of information and communication technology while carrying out other tasks and activities at the same time (multitasking). This causes psychological pressure for the person, especially if the performance of these tasks exceeds the person's cognitive abilities and experiences. Also, this would lead to digital stress. As for the interpretation of online vigilance prediction of depression symptoms, it may be caused when the individual feels isolated he resorts to the use of communication via the Internet and attention and attention to all the messages and communications that come to him. This may have an adverse effect on him and thus lead to the appearance of symptoms of depression. Excessive reliance on online means reduces daily activities and social interactions and leads to a decrease in individual productivity, anxiety and depression, as depression as mentioned earlier can be the cause or result of addiction and excessive dependence on the Internet.

Recommendations

Providing educational workshops for university students on the concept of online vigilance and the need to reduce the use of digital media to reduce online vigilance.

Further studies on the relationship of online vigilance to digital stress.

Spreading awareness among students about the danger of relying on technological media connected to the Internet in practicing all activities by holding seminars and meetings with them related to this matter.

The need to focus on developing students' skills in managing their time and achieving a balance between academic and personal life.

Conduct further studies on the relationship of digital stress to depression symptoms.

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