# The relationship between loneliness, depression, internet and social media addiction among young Polish women

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**Abstract.** – **OBJECTIVE:** When speaking of behavioral addictions (especially to the Internet and social media), it is emphasized that it is not the environment that is the main contributor to addiction, but rather certain behaviors and personality traits. The aim of this study was to assess the level of Internet and social media addiction on the example of Facebook with regard to psychological and social factors.

**SUBJECTS AND METHODS:** This survey-based study involved a group of women representing the female population in the West Pomeranian Voivodeship, Poland (N = 556). Research instruments were a self-developed questionnaire concerning sociodemographic data, the De Jong Gierveld Loneliness Scale, the Beck Depression Inventory, the Internet Addiction Test, and the Bergen Facebook Addiction Scale.

**RESULTS:** Age, depressive symptoms, loneliness were the variable contributing to Internet and Facebook addiction among the studied. Available studies confirm the results of their own research.

**CONCLUSIONS:** Depressive symptoms and dependence on the Internet and Facebook were more common among single women. In the employed women, we only observed higher levels of Internet and Facebook addiction. The level of dependence on the Internet and Facebook was higher among younger women. Loneliness correlated with Internet and Facebook addiction, and more severe depressive symptoms entailed higher levels of Internet and Facebook addiction.

*Key Words:*
  Behavioral addiction, Internet addiction, Facebook addiction, Women.

## Abbreviations

AAT = the American Academy of Pediatrics; BDI = The Beck Depression Inventory; BFAS = The Bergen Facebook Addiction Scale; ICD-10 = International Classification of Diseases 10th; DJGLS = The De Jong Gierveld Loneliness Scale; DSM-5 = the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders; IAT = The Internet Addiction Test; MRI = Magnetic resonance imaging.

## Introduction

The problem of addiction to the so-called 'new' media has been present in literature for many years. For nearly a decade, researchers have been emphasizing that addiction does not necessarily develop as a result of using addictive substances, but can be an effect of excessive contact with digital technologies[1,2].

The concept of Internet Addiction Disorder (IAD) was introduced in 1996 by Kimberly Young, who recommended its inclusion in the Diagnostic and Statistical Manual of Mental Disorders (DSM). Unfortunately, due to the difficulty determining the psychopathological basis of IAD, as well as the boundary between functional and non-functional Internet use, IAD is not considered a diagnostic entity in the DSM-5[3].

According to the International Statistical Classification of Diseases and Related Health Problems 10th revision, also known as the International Classification of Diseases 10th revision (ICD-10), Internet addiction is not a distinct nosological entity, but a 'habit and impulse disorder, unspecified'. In the standard classification of mental disorders (the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders, DSM-5) of the American Psychiatric Association, it has been added to the subgroup of disorders that require further investigation in the group of Addictive Disorders[4].

Difficulties in classifying Internet addiction have resulted in a number of terms, such as Internet addiction disorder, problematic Internet use,

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compulsive Internet use, Internet overuse, problematic computer use, and pathological computer use. Internet addicts can be classified as specific and generalized types depending on the target of the behavior. Specific type addicts use the Internet for particular purposes, such as satisfying sexual needs, playing games online, gambling, doing shopping. Generalized type addicts, on the other hand, have no specific goals using the Internet, and yet they tend to use it excessively[5].

The causes of Internet and social media addiction are still the subject of research. It has been found that some personality traits, such as impulsivity, involve both Internet and social network addiction[6]. What is more, Internet addicts develop changes in the metabolism of the cerebral cortex that are very similar to those observed in other behavioral addictions and chemical substance dependence (e.g., disturbed glucose metabolism)[7]. Magnetic resonance imaging (MRI) reveals activation of the same brain areas[8]. Addictions can be triggered by a number of factors, among them: genetic, neurobiological, psychological, social, spiritual.

Numerous scientists consistently regard addiction as a multifactorial phenomenon, which includes many aspects of human functioning from evolutionary adaptation through the quantum and biochemical mechanics of the brain to the complex and multidimensional interaction between a person and the environment[9].

The exact causes of addiction have not been fully understood. Hou et al[10] suggest the role of genetic background. When speaking of behavioral addictions, it is emphasized that is not the environment that is the main contributor to addiction, but rather certain behaviors and personality traits, among them depression, anxiety, hostile/aggressive behavior, impulsivity, psychotic behaviors, neuroticism, shyness, low self-esteem, and dissocial personality traits (manifested by a lack of empathy, and a failure to comply with social, legal and safety standards)[11,12].

Currently, there is no "gold standard" of treatment for people suffering from Internet and social media addiction. Nevertheless, researchers agree that in working with patients, the main goal should be to implement control over Internet activity, rather than total abstinence. Treatment and prevention strategies include cognitive behavioral therapy. Before implementing this therapy, it is necessary to examine the specific models of using the Internet and social media by the patient, and then introduce new elements to the existing schemas. Family support groups are organized to break predefined harmful patterns, and to support the effects of therapy with a dedicated program that controls the intensity of network use[13].

The aim of this study was to assess the level of Internet and social media addiction on the example of Facebook with regard to psychological (depressive symptoms, loneliness) and social (marital status, employment, age, education, place of residence) factors.

## Subjects and Methods

### Participants

This study was conducted among female residents of the West Pomeranian Voivodeship, Poland. It involved a group of 556 women representative of the female population in this region. 600 questionnaires were randomly distributed among women in offices and workplaces, 93% of which were returned. 556 correctly completed questionnaires were used in the study, 35 were rejected due to incorrect completion, and 9 for not meeting the inclusion criteria.

### Measures

The following standardized research instruments were employed:

1. The De Jong Gierveld Loneliness Scale (DJGLS) – consists of 11 items: six are formulated negatively and five are formulated positively. Answers are rated on a five-point Likert scale. The higher the final score, the greater the loneliness. This one-dimensional scale can be used to measure overall loneliness both in individual diagnosis and in scientific research[14,15].

2. The Beck Depression Inventory (BDI) is a 21-item self-report measure of depressive symptoms. The points are summed up and final scores reflect the severity of depressive symptoms. A score of Scores ranging from 0 to 11 points denotes a lack of depression, 12-19 points – mild depression and a recommendation to consult a psychologist/psychotherapist for further diagnosis, 20-25 points – moderate depression and a recommendation to take actions and see a psychologist/psychotherapist/psychiatrist, and 26-63 points – severe depression and the necessity to see a psychiatrist[16].

3. The Internet Addiction Test (IAT) has been developed by Kimberly Young, based on the criteria of pathological gambling included in the Diagnostic and Statistical Manual of Men-

tal Disorders (DSM-4) of the American Psychiatric Association. The IAT is addressed to Internet users (those who use it on a daily basis). This 20-item questionnaire measures characteristics and behaviors associated with compulsive use of the Internet that includes compulsivity, escapism, and dependency[17]. The Polish version of the IAT has been prepared by Hawi, Błachnio and Przepiórka[2]. Previously, the IAT was validated by Poprawa in 2011, but his version diverged from the original one – the number of items was increased to 22, and they were changed from questions to statements. The maximum possible score is 100 points. Scores between 0 and 39 points denote average Internet users, scores between 40 and 69 points – Internet users who occasionally or frequently have problems caused by using the Internet, and scores of 70 points or more indicate problematic use of the Internet[18].

4. The Bergen Facebook Addiction Scale (BFAS) – is an instrument for measuring Facebook addiction, developed by T. Torsheim, GS. Brunborg, and S. Pallesen from the Faculty of Psychosocial Sciences, University of Bergen. The instrument is a pool of 18 items, three reflecting each of the six core elements of addiction: salience, mood modification, tolerance, withdrawal, conflict, and relapse. Answers are rated on a five-point scale: 1—very seldom, 2—seldom, 3—sometimes, 4—often, 5—very often. Each question refers to behaviors associated with using Facebook during the previous year. The higher the final score, the higher the level of Facebook addiction. The BFAS has been adapted to Polish conditions by Edyta Charzyńska and Jolanta Góźdź from the Faculty of Psychology, University of Silesia[19,20].

### Procedure

This study is based on a questionnaire survey. The inclusion criteria were: female sex, age (> 18 years), a lack of self-reported mental disorders, and place of residence in the West Pomeranian Voivodeship. The exclusion criteria were not meeting the inclusion criteria and clinically confirmed mental disorders. The survey was conducted between October 2016 and May 2017. Participation was voluntary and anonymous. The data collectors explained to all participants the requirements of the questionnaires using standard instructions and emphasized the authenticity, independence, and integrity of all answers. The respondents were informed in writing about

the purpose and course of the research, and that they can resign at any stage of the study. The questionnaires were collected immediately after they were completed. The average time for completing the measures was approximately 35 min. Participants were not compensated for participating in the study.

### Statistical Analysis

Was performed using STATISTICA 13.0 PL (Tibco Software Inc, Palo Alto, CA, USA) and StataSE 12.0 (StataCorp, College Station, TX, USA). Statistical significance was set at a $p$-value below 0.05. All tests were two-tailed. Imputations were not done for missing data. Nominal and ordinal data were expressed as percentages, while interval data were expressed as mean value ± standard deviation in the case of a normal distribution or as the median (Me) and lower $(Q_1)$ / upper $(Q^3)$ quartile in the case of data with skewed or non-normal distribution. Distribution of variables was evaluated by the Shapiro-Wilk test, quantile-quantile plot and the Cullen-Frey graph. Homogeneity of variances was assessed by the Fisher-Snedecor test. For comparison of data, the Student $t$-test for independent data (also after logarithmic transformation of data, if appropriate) or the non-parametric Mann-Whitney U test were used. Categorical variables were compared using $\chi^2$-tests. To assess the relationship between variables, the ordinary least square regression was used with the Pearson correlation coefficient as a measure of association. In the case of non-normal residuals, the Spearman rank correlation was used. The Cook-Weisberg test and Cameron & Trivedi's decomposition test was used to test the residuals for heteroskedasticity as well as the violation of skewness and kurtosis assumptions in linear regression.

### Ethics Statement

The study was carried out in accordance with the Declaration of Helsinki, and the protocol was approved by the Bioethical Commission of Pomeranian Medical University in Szczecin (approval number KB-0012/518/12/16). All subjects were informed about the study and all provided informed consent.

## Results

The study involved 556 women aged 34 ± 15 years (median = 27 years, lower/upper quartile

= 22.0/45.0 years). Of them, 269 (48.4%) had third level education, 263 (47.3%) lived in cities with a population of more than 100 thousand, 370 (66.5%) were married or cohabiting, 496 (89.2%) were employed. According to the BDI, 69 (12.4%) women had mild depressive symptoms (≤11 points), 25 (4.5%) had moderate depressive symptoms (12-26 points), 15 (2.7%) had severe depressive symptoms, and 447 (80.4%) women had no depressive symptoms. 151 (27.2%) women were at risk of Internet addiction, and 27 (4.8%) were addicted. 91 (16.4%) women obtained scores suggesting the possibility of addiction to Facebook, and 78 (14.0%) achieved scores indicating addiction.

The severity of depressive symptoms according to the BDI was Me = 4.5 ($Q_1$ = 1.0, $Q_3$ = 10.0) points, the level of loneliness according to the DJGLS was Me = 34.0 ($Q_1$ = 32.0, $Q_3$ = 36.0) points, the level of Internet dependence was Me = 31 ($Q_1$ = 23.0, $Q_3$ = 43.0) points, and the level of Facebook addiction was Me = 8.0 ($Q_1$ = 6.0, $Q_3$ = 11.0) points.

### The Severity of Depressive Symptoms, the Level of Loneliness, and the Level of Internet and Facebook Addiction With Regard to Sociodemographic Data

There were statistically significant differences in the severity of depressive symptoms according to the Beck Depression Inventory, and the level of Internet and Facebook addiction depending on marital status. The single women had statistically significantly more severe depressive symptoms, and higher levels of Internet and Facebook addiction than the women having partners (Table I).

There were statistically significant differences in the levels of Internet and Facebook addiction of the studied women depending on their employment status. The employed women had a statistically significantly higher level of Internet and Facebook addiction than their unemployed counterparts (Table II).

Education and place of residence had no statistically significant effect on the severity of depressive symptoms according to the BDI, loneliness, or Internet and Facebook addiction.

### Analysis of the Relationships Between Sociodemographic Data, the Severity of Depressive Symptoms, Loneliness and Selected Behavioral Addictions

Analysis of the relationships between sociodemographic data, the severity of depressive symptoms according to the BDI, a feeling of loneliness, and selected behavioral addictions demonstrated that the only factor contributing to Internet addiction was age.

There was a statistically significant moderate negative correlation between the $\log_{10}$ of the IAT results and the $\log_{10}$ of age (r = -0.34; *p* < 0.001).

The only variable contributing to Facebook addiction is age. There was a statistically significant moderate negative correlation between the $\log_{10}$ of the IAT results and the $\log_{10}$ of age (r = -0.28; *p* < 0.001).

There was a statistically significant correlation between the scores on the DJGLS and on the IAT – a weak negative correlation (r = -0.10; *p* < 0.05), and between the scores on the DJGLS and on the BFAS – a weak negative correlation (r = -0.16; *p* < 0.001).

There was a statistically significant Spearman's rank correlation between the scores on the BDI and the scores on the IAT – a moderate correlation (r = 0.30; *p* < 0.001), and between the scores on the BDI and the scores on the BFAS – a weak correlation (r = 0.23; *p* < 0.001). Severe depressive symptoms entail higher levels of Internet and Facebook addiction.

## Discussion

Behavioral addiction to so-called 'new' media is an increasingly serious problem in society.

**Table I.** The severity of depressive symptoms, the level of loneliness, the level of Internet and Facebook addiction with regard to marital status.

|  | Married/cohabiting n = 370 | Single n = 186 | *p*-value |
|---|---|---|---|
| BDI | 4.0 (1.0-9.0) | 6.0 (2.0-11.0) | < 0.05 |
| *DJGLS* | 34.1 ± 3.9 | 33.8 ± 3.9 | 0.44 |
| IAT | 29.0 (23.0-40.0) | 36.0 (25.0-48.0) | < 0.001 |
| BFAS | 8.0 (6.0-11.0) | 8.0 (6.0-12.0) | < 0.05 |

BDI, Beck Depression Inventory; *DJGLS*, De Jong Gierveld Loninees Scale; IAT, Internet Addiction Test; BFAS, Bergen Facebook Addiction Scale; mean ± standard deviation or median (lower quartile-upper quartile).

**Table II.** The severity of depressive symptoms according to the BDI, a feeling of loneliness, and Internet and Facebook addiction in the studied women depending on their employment status

|  | Employed n = 496 | Unemployed n = 60 | *p*-value |
|---|---|---|---|
| BDI | 4.0 (1.0-10.0) | 6.5 (1.5-12.5) | 0.20 |
| *DJGLS* | 34.1 ± 3.7 | 33.0 ± 5.0 | 0.09 |
| IAT | 32.0 (24.0-44.0) | 24.5 (20.0-32.0) | < 0.001 |
| BFAS | 8.0 (6.0-12.0) | 6.0 (6.0-7.5) | < 0.001 |

BDI, Beck Depression Inventory; *DJGLS*, De Jong Gierveld Loneliness Scale; IAT, Internet Addiction Test; BFAS, Bergen Facebook Addiction Scale; mean ± standard deviation or median (lower quartile-upper quartile).

The available publications so far have mostly concerned teenagers, almost completely ignoring adult people. Ours is the first large-scale study to measure behavioral addictions in the population of adult women.

According to own research, 27.2% of women were at risk of Internet addiction, and 4.8% were addicted. 16.4% of women obtained scores suggesting the possibility of addiction to Facebook, and 14.0% achieved scores indicating addiction. In comparison, the research conducted in Great Britain among students revealed an 18 percent incidence of Internet Addiction Disorder (IAD), and in Italy a 0.8 percent incidence. According to Weinstein and Lejoyeux's review, incidence rates for IAD in the US and in Europe range from 1.5% to 8.2%[21,22].

Social media and online gameplay, which are the most common digital venues for meeting friends, belong to the main sources of dependence to the Internet. People overusing the Internet claim that life in the net looks real, and that meeting friends online is emotionally enriching[23].

Our investigation showed that severe depressive symptoms were related to a higher level of Internet addiction among adult women. We observed a statistically significant correlation between the scores on the BDI and the scores on the IAT. These results correspond with those reported by other authors, who informed that people suffering from depression are more likely to develop Internet dependence[24,25]. Loneliness and social isolation caused by excessive use of the Internet can provoke concomitant depression in people with Internet dependence[26]. Li et al[27] confirmed the role of anxiety and depression as contributors to Internet addiction. However, all available studies have been conducted among men and women.

Bhardvaj et al[28] measured the severity of depressive symptoms with reference to Internet addiction among teenagers in Udhampur. Similarly to us, the authors employed the BDI and the IAT. The results demonstrated that Internet overusers suffered from more severe depressive symptoms according to the BDI. The mean BDI result achieved by the Internet non-addicts was threefold lower than that obtained by the addicted participants. Bahraian and Khazaee[29] found that depression and low self-esteem were two main factors that contributed to and enhanced Internet dependence in students. Zaffar et al[30] have described a linear interaction between addiction to Facebook, anxiety and depression. However, neither the results obtained by Sanders et al[31], nor those reported by Niemz, Griffiths and Banyard[3] show a relationship between the severity of depressive symptoms and addiction to the Internet[2].

In our analysis, severe depressive symptoms involved higher levels of Facebook addiction among adult women. There was a statistically significant correlation between the BDI and the BFAS results. Our findings correspond with those obtained by Koc et al[23] implemented among students, who informed that greater severity of depressive symptoms, anxiety and insomnia was accompanied by higher levels of Facebook addiction. Depressive symptoms strongly correlate with many addictive behaviors, including problematic use of social networks[33].

According to Brailovskaia, Margraf and Kollner[34] the average level of Facebook addiction was considerably higher in hospitalized patients with mild depression than in those with moderate depression. Narcissistic personality and the time of using Facebook statistically significantly contributed to a higher level of Facebook addiction.

In 2011, the American Academy of Pediatrics (AAP) brought into general use the term of 'Facebook depression', which refers to the situation when teenagers who spend a significant amount of time on Facebook show symptoms of depression[35].

However, the study of Turkish patients undergoing hemodialysis revealed that having a Facebook account was related to lower severity of depressive symptoms[36], which suggests that using Facebook

can help cope with the disease and improve mental well-being. This, however, only refers to normal utilization, and not to overusing social networks. There are also reports[37,38] which did not reveal any connection between the severity of depressive symptoms and using social networks. Therefore, further research is needed to define the relationship between using Facebook and the severity of depressive symptoms more precisely.

It is important that the studies of others were carried out among adult men and women. However, own research was conducted in a group of adult women.

Demographic data had no statistically significant effect on the level of Facebook dependence. Our results also demonstrated that the level of Facebook addiction decreases with age among adult women. Błachnio et al[39] claim that sex, age, and daily time spent on the Internet have a statistically significant impact on the level of Facebook addiction – longer time on the Internet, younger age, and male sex were associated with higher levels of Facebook addiction.

Our analysis demonstrated statistically significant negative correlations between the DJGLS score and the scores on the IAT and the BFAS – lower loneliness went together with more severe Internet and Facebook addiction among adult women. Rębisz et al[40] reported a statistically significant bilateral positive correlation – the higher the level of Internet addiction, the stronger the feeling of loneliness, and vice versa.

Błachnio et al[41] analyzed the role of loneliness in developing Facebook addiction in five countries different in terms of industrial, economic, social, and technological context, namely Poland, Slovakia, Syria, Ecuador, and Malaysia among women and men. In Malaysia, the authors observed a negative correlation between loneliness and the level of Facebook addiction only in the oldest respondents – older people who felt alone rarely overused Facebook. Nevertheless, another study shows that Facebook can be a platform for social contacts for people of all ages. What is more, the results confirmed that loneliness had an impact on the problematic use of Facebook in Malaysia: the respondents who had more friends were less likely to develop Facebook addiction. In Poland, those who felt lonely did not search for friends on Facebook. In Ecuador, a lower level of loneliness entailed a higher level of Facebook addiction. The respondents who obtained low scores for emotional and social loneliness had many friends in real life. Overuse of the Internet

negatively correlated with social loneliness, and positively to emotional loneliness[42].

Addiction to Internet and social media is an increasingly serious problem in society. Internet users are both young and older people, and their number is growing year on year. Our research was the first large-scale study to measure behavioral addictions in the population of adult women, but this issue requires further research.

## Conclusions

1. Both Internet and Facebook addiction and depressive symptoms, according to the BDI, were more common among single women than among those having partners. The employed women had higher levels of these two addictions.
2. The only variable having an effect on Internet and Facebook addiction was age – the level of addiction was higher in younger women.
3. The feeling of loneliness was a psychological variable which correlated with Internet and Facebook addiction. Greater severity of depressive symptoms involved higher levels of Internet and Facebook addiction.

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