

## Analysis of instagram profiles found through inscriptions on the walls of the In – Patient Adolescent Psychiatry Unit at the University Hospital in Kraków, Poland.

Katarzyna Urbanek-Matusiak, Aneta Katerla, Agata Szczecina, Maciej Pilecki

### Summary

**Aim of the study:** Adolescents are increasingly active in social media: 72% use Instagram while as many as a quarter suffer from at least one mental disorder, Internet users among them. A number of studies confirming the mutual influence of social media and mental health have been conducted but there is a shortage of data on the Internet activity of people suffering from mental disorders. This study aims at extending the existing knowledge by analyzing Instagram accounts of adolescent psychiatric in-patients..

**Material and Methods:** We analyzed the contents of Instagram accounts, links to 36 of which were hidden in graffiti drawn by patients on the walls of an inpatient adolescent psychiatric ward. After excluding inactive and nonexistent accounts, 21 addresses were analyzed with respect to the number and content of published posts and comments left under them.

**Results:** 90% of the accounts belonged to girls. 52% revealed the owner's identity. The posts were mainly depressive, which correlated with the psychopathology of the patients. The comments differed in number and in character depending on the content of the post: replies to posts related to body image were mainly supportive, while comments on posts related to self-harm mainly expressed sympathy..

**Discussion:** Most of the analyzed Instagram posts are related to the typical psychopathology of the patients hospitalized on our ward. In addition, it is also similar to negative effects that social media may have on mental health.

### Conclusions:

The association found in the study show that conducting further research on social media use by psychiatric patients may be clinically important.

**Instagram, youth mental health, social media**

### INTRODUCTION

In an era when the Internet is universally accessible and social media are unwaveringly popular, their influence on the mental health of an individual is the focus of growing attention. A recent study conducted by the Pew Research Center on a group of American teenag-

---

Katarzyna Urbanek-Matusiak<sup>1</sup>, Aneta Katerla<sup>2</sup>, Agata Szczecina<sup>2</sup>, Maciej Pilecki<sup>1,3</sup>: <sup>1</sup>Department of Adult, Child and Adolescent Psychiatry, The University Hospital in Krakow, Poland; <sup>2</sup>J. Dietl Specialist Hospital, Krakow, Poland; <sup>3</sup>Child and Adolescent Psychiatry Department, Jagiellonian University Medical College, Krakow, Poland

**Correspondence address:** urbanek.katarzyna@yahoo.com

ers has shown that 95% of children aged 13 to 17 have access to a smartphone, while 45% state that they are online practically all the time [1] using social media.

Instagram, one of social networking services, is a platform based on sharing photos and image content with other users with an average of 95 million posts published daily [2]. It is the second most popular, after Youtube, social networking service among teenagers – in the conducted study 72% of adolescents confirmed using it [2]. In comparison, according to a similar study conducted between 2014 and 2015, 52% of teenagers confirmed the same, which is a considerably smaller number. This is most likely due to the change of trends in using particular services – e.g. it is known that young adolescents, especially ones who have had contact with psychoactive substances, prefer Snapchat, while a similar group withdraws from Facebook, among others because of the fact that it is used by their parents or other adults [1, 3]. Current data shows that 25% of the youth suffer from mental disorders or emotional problems [4]. Most of them are also Internet users. There is considerable data pointing to the connections which psychopathology may have with the use of the Internet. It is a two-way interdependence. Research shows both the negative influence of Internet use on the mental and physical health and the type of online activity of people with mental problems. In this case the Internet may aggravate the problems or such activity may influence other users. Many studies have shown among others increased incidence of depressive symptoms in people using social networking services [5-16].

In 2011 the American Academy of Pediatrics first defined the term “Facebook depression” as the symptoms of depression exhibited by children spending a great deal of time on social media sites [17]. A meta-analysis published in 2019 confirmed the earlier findings of the negative influence of Instagram use on mental health and established that the dominant factors related to the incidence of such symptoms were comparing oneself to others and, to a lesser extent, the amount of time spent on using social media [16]. In this context the result of another study, pointing to Instagram, a service based on the visual presentation of published content, as the most harmful to mental health [18] comes

as no surprising. Interestingly, a study conducted on a group of young adults who were not Instagram users showed that a week of mere exposure to posts depicting attractive people of the same sex negatively influenced the level of their own body satisfaction in the group of female subjects of the study [19]. Teenagers seem to be particularly sensitive to the influence of social media. This is because adolescence is a special period in life when the formation of a stable and coherent identity is one of the main development tasks [20]. Acceptance and positive judgment by peers plays an important part in the creation of self-image [21], which is why adolescents put a lot of effort into publishing content and creating images which would, in their view, be positive in the eyes of potential judges. Since in the case of social media the identity of the audience is often unknown to them, they rely on so-called imagined audience, which is in fact their conceptualization of the people they communicate with by the posts they publish [22]. Therefore it can be said that social media form an alternative and, through the countable number of likes and comments, more tangible, although often also unreal space for the performance of an important children’s development task – creating one’s own identity. It may be one of many reasons for the great popularity of social networking services among the youth [23-25]. It can be assumed that we begin to function in a reality in which part of development tasks have been moved from offline to online reality. An interesting observation in this context is that the solidification of an individual’s personality traits which is found at the end of the development path of forming one’s self is indeed reflected in the content published by or posts liked by a given person [26]. Another study worth noting is one concerning posts related to self-harm. It found that a visible escalation of self-aggressive behaviour or using different self-harm techniques markedly increases the number of comments left under a post [27-29]. Seeing as popular posts cause more intense brain reactions visible on fMRI (functional magnetic resonance imaging) and prompt to like a given post more than less popular ones [30] it seems to have a threatening impact which may reinforce self-aggressive behaviours, especially if appropriate therapeutic activity is not under-

taken. As shown in a study by Frison and Eggermont [9] an increase in the number of posts may also be a symptom of the presence of depressive symptoms connected with comparing oneself to others, which occurs after the initial period of only following the posts. Most of the studies conducted so far concern mainly the occurrence of symptoms in the entire group of Instagram users, whereas research concerning online activity of individuals with mental disorders is still scarce. It is worth pointing out that according to studies in many countries at least 10% of patients in psychiatric care had serious problems with Internet overuse [31, 32]. Based on the research conducted in our center one in three teenagers consulted at the Out-Patient Psychiatric Clinic for Children and Adolescents at the University Hospital, Kraków, Poland use the Internet in a problematic way, according to his/her opinion [33]. It is not easy to study the online behaviour of psychiatric patients. Majority of research involve rather adults than adolescents. It is relatively rare for clinicians to be able to view the nature of their patients' online activities. It turns out that the direct interview can be supplemented by analyzing the activity of patients in the offline world, which relates directly to their online presence. Despite regular renovations, the walls at the In-Patient Adolescent Psychiatry Unit at the University Hospital in Kraków, Poland, where adolescent patients are hospitalized, are full of scribbles left by them. The period when nothing is written on the walls is short and once the first inscriptions appear, their number grows exponentially. The Unit is underfinanced and cannot be renovated often enough to keep the walls free from graffiti. Owing to this we gain access to content unrevealed to us in any other form, which, due to clear, although insufficiently researched connections between psychopathology, adolescence and the Internet, is an important subject matter to be analyzed. Among numerous scribbles on the walls of the unit 36 URLs of Instagram pages

were found. The analyzed inscriptions have appeared within the last 2 years, which is the period that has elapsed since the Unit was last repainted.

The purpose of the study is to analyze the content published on the pages and to determine a possible associations with the data ob-

tained by other studies concerning the negative effects of using Instagram, such as the occurrence of depressive symptoms or a negative body image.

## MATERIAL AND METHOD

The In-Patient Adolescent Psychiatry Unit at the University Hospital in Kraków, Poland has 32 beds. The Ward operates within the therapeutic community paradigm. The department admits patients aged 14-18 from Małopolska Region. 75% of hospitalizations are acute. Patients are admitted mainly for life-saving indications and the largest group of patients are adolescents with active suicidal thoughts and tendencies related to various forms of psychopathology. Up to the 25% of patients at the Unit has diagnosis of anorexia nervosa. In 2018 68.9% of the hospitalized patients nominal gender was female and the remaining 31.1% male. The average period of hospitalization was 41 days. URLs of Instagram pages were collected from the walls of the In-patient Unit. Inscriptions on the walls, including the analyzed links to Instagram profiles, have been created within the last 2 years, i.e. since the Department was last repainted. The analysis included the description of the profile, the number of posts, the number of followers and the number of users followed. In case of public profiles the content of the posts was analyzed. Most of the Instagram content was published in Polish. According to a predetermined key the profiles were assigned to the following categories based on their content: dark posts (related to gloomy subcultures like 'emo'), depressive posts, neutral/other posts, art, love, meaning of life, cigarettes/alcohol, posts related to body image, self-harm, insomnia, manga, piercing/tattoos, coming out, suicide, vegetarianism, healthy diet, body painting, gruesome posts, religion, family problems, violence, drugs, LGBT. Additionally, posts categorized as depressive, related to suicide or presenting self-harm were analyzed as to the day of the week on which they were added. Comments under the abovementioned posts were also read and divided according to the following key: neutral, supportive, expressing sympathy and willingness to help. Information on the authors' identities was also ana-

lyzed by checking whether they reveal their first names, first names, full names or faces.

Findings

We found 36 URLs of Instagram pages at the walls of the In-patient Unit. 15 profiles which did not exist anymore or were inactive were excluded from the analysis. Basic information regarding the remaining 21 profiles was collected. 16 of the remaining 21 profiles had descriptions: 7 descriptions included depressive content (examples – original spelling and punctuation were preserved: “Prawdziwe smutne i żałosne życie pani Lucyny” (“Ms Lucy’s real sad and miserable life”), “15yo.Unhappy depressed kid”, “Just kill me now. I’m so tired of being used. No real friends. All alone”), whereas 4 concerned body image (examples: “14 years old. Weight 37. Depressed. Still too fat.”, “Hi guys! I hope u’re gonna help me to be skinnier”, “DISGUSTING FAT BITCH I have huge mess in my mind. I will never fix myself. I gave up. Inpatient now.”). One of the profiles was described as suspended; supposedly due to the owner’s death (“Zawieszone † 4.07.2017” – “Suspended † July 4th, 2017). The average number of posts (M) was 53, the median (Me) was 12. For the number of followers the numbers were: M = 365, Me = 187, and for the number of users followed: M = 195, Me = 190 (Table 1). 11 out of the 21 profiles included some information related to the owner’s identity: 9 authors revealed their names, 6 revealed their full names, and 7 revealed their faces (Table 2). 90% of the profiles owned by people whose identity was known belonged to girls. 12 profiles which turned out to be public were analyzed as to their content. The results of this analysis is included in Table 3.

Table 1. Basic statistical data of the analyzed profiles.

	Total	Average	Median
Number of posts	1113	53	12
Number of followers	7660	365	187
Number of users followed	4093	195	190

Table 2. Anonymity of the profile owners.

Reveals first name	Reveals full name	Reveals face
9/21	6/21	7/21

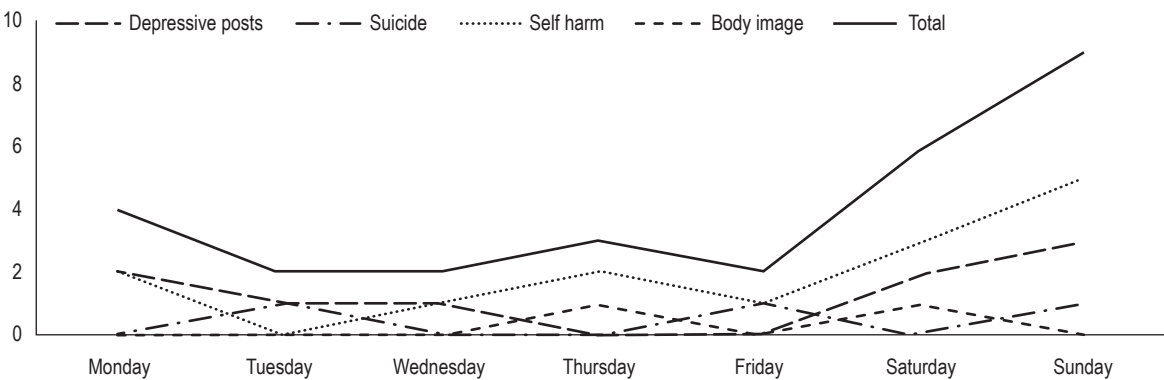
Table 3. Content of analyzed Instagram profiles.

Content	Occurrence	Content	Occurrence
Dark/subculture	6	Coming out	1
Depressive	5	Suicide	1
Neutral/other	4	Vegetarianism	1
Art	4	Healthy diet	1
Love	4	Body painting	1
Meaning of life	3	Gruesome	1
Alcohol/cigarettes	3	Religion	1
Concerning body image	2	Family problems	1
Self-harm	2	Violence	0
Insomnia	2	Drugs	0
Manga	2	LGBT	0
Piercing/tattoos	2		

Most profiles (6) present content which is dark and connected with a subculture, then there are profiles which contain depressive content (5) and ones with posts which are neutral, connected with art or love (4 profiles in each of the three categories). No references to violence, drugs or LGBT content was found on the analyzed pages. In case of posts including content classified as depressive, related to suicide or presenting self-harm information on the day of the week on which the posts were added was collected and analyzed. The detailed results of this analysis are presented in Table 4 and Graph 1. Data concerning comments under the analyzed posts is presented in Table 5 and Graph 2. Most supportive comments were left under posts concerning body image, while comments expressing sympathy and willingness to help were found mainly under posts concerning self-harm.

**Table 4.** Adding posts identified as depressive, concerning the meaning of life, suicide, self-harm and body image by day of the week.

Day the post was added	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Depressive posts	2	1	1	0	0	2	3
Meaning of life	0	0	0	1	0	0	0
Suicide	0	1	0	0	1	0	1
Self-harm	2	0	1	2	1	3	5
Body image	0	0	0	1	0	1	0
Total	4	2	2	4	2	6	9



**Graph 2.** Posts identified as depressive, concerning suicide, self-harm and body image and types of comments.

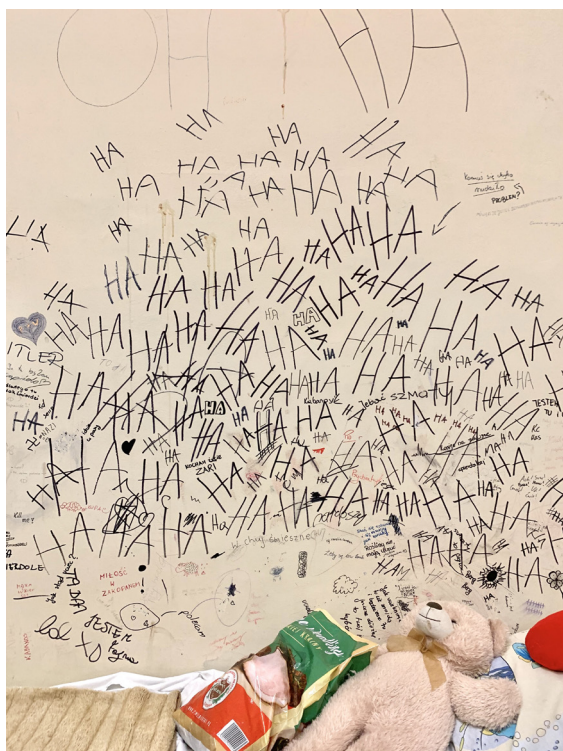
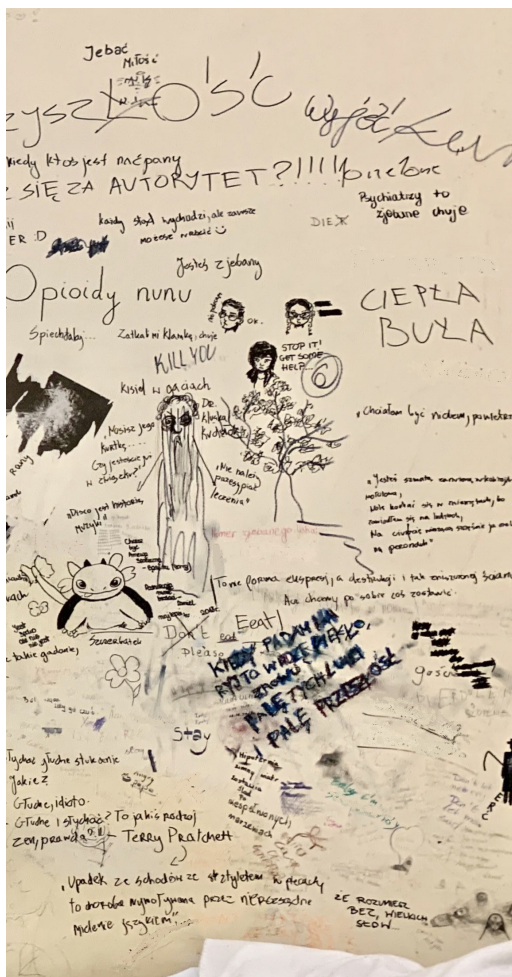
**Table 5.** Posts identified as depressive, concerning suicide, self-harm and body image and types of comments.

	Number of posts	Comments expressing sympathy/ willingness to help	Neutral comments	No comments	Supportive comments
Depressive posts	10	1	4	5	0
Suicide	3	0	0	3	0
Self-harm	14	4	4	6	0
Body image	2	0	0	0	2
Total	29	5	8	14	2

One post devoted to “coming out” due to the sexual orientation was found during the analysis. It featured a photo of a girl with a package of antidepressant medication; the girl’s face was clearly visible. Among the hashtags were: “przerywam milczenie” “breaking the silence”),

“depression”, “ascentra” (brand name of sertraline), “pills”, “sad”, “cry”, “niebojesie” (“Imnotafraid”), “choroby psychiczne” (“mental illnesses”), psycho”. Comments under the post were supportive and expressed sympathy.





## DISCUSSION

The analysis of Instagram profiles whose URLs are among many inscriptions on the walls of the In-Patient Adolescent Psychiatry Unit at the University Hospital, Kraków, Poland is a fragment of a wider phenomenon that is the graffiti of different kinds repeatedly placed on the walls by the patients. It is difficult to structure the analysis of this phenomenon. The content found in this form on the walls is mostly the manifestation of preferences and traits of a given person, a group or a subculture which they represent. It can be assumed that Instagram profiles serve a similar purpose: they are a virtual representation, a social cyberface, a created image of the owner of the profile. Finding a few dozen URLs of the patients' Instagram profiles on the walls of the Unit, where camera phones are banned, seems to be a meeting on the border of being offline and online, which, given the proved and very strong impact of social media on adolescents, may additionally increase the significance of the mutual influence of social media and the mental health of an individual.

An interesting observation is the reflection of the proved negative consequences of being an Instagram user in the form of the content revealed on the patients' pages. Our analysis shows that this content is mainly the expression of depressiveness and a negative image of one's own body, which most often forms a continuum of symptoms of self-aggression. It can be seen that the most common traits observed in hospitalized patients in the Unit and the major negative consequences of using Instagram (such as decreasing self-esteem or triggering of depressive symptoms [5-16]) are similar. It is also worth noting that girls are both the majority of owners of the Instagram profiles revealed in the form of inscriptions on the walls and the majority of the patients in the Unit. At the same time they are a group which is most susceptible to deterioration of mental state caused by Instagram content [19].

The collected data shows that posts were published mainly at the weekends, specifically on Sundays, which is associated with the fact that during the hospitalization the patients spend some weekends outside the Unit on leaves of absence, during which time (unlike when in

the Unit) they use the Internet freely and are in touch both with other patients and with people from outside the Unit. It does not leave the Unit, which functions as a therapeutic community, unaffected [34]. In the theory of such communities their so-called “second lives”, not surfacing in the general discourse, are considered one of the worst phenomena. An illustration of the Unit’s second life is, among others, the analyzed graffiti, whose content is often oppositional to the Unit’s staff and which often rapidly increases in amount following difficult situations taking place in it. However, taking into account the intense reactions between patients in social media, it can be said that we are beginning to face not only the Unit’s second life but also a third one, which generates completely new challenges to adolescent psychiatry. It is often patients and not the staff who are first informed of the former patients’ plans to return to the Hospital, of coordinated suicide attempts or of declarations of increased suicidal thoughts and tendencies in patients. To give an example of such an activity, a few years ago the Unit therapists reported information passed by some patients of the existence of a Facebook group composed of the Unit’s current and former patients and their close friends. The content of the conversations held by the group only sporadically surfaced in the general discussion with the staff. At the moment there is no information of the existence of this or a similar group, but it is difficult to ascertain whether the group has ceased to exist or whether the patients are hiding it or do not bring it up in spontaneous conversations. It is a fact reported by the therapists that patients avoid the topic of their activity in social media as they consider it unimportant or too private and hermetic to be discussed with adults. It seems to be another type of activity to which we have too little access and about the significance of which we have too little knowledge. Such patients’ immense activity in social media results in a situation in which the patients’ daily life is influenced not only by interactions between them, their families and the staff, but also by the Unit former or future patients. Can such situations as described in paper should be prevented and if so, how? How can the obtained information be used? Are there or can there be appropriate preventive methods for the negative consequences

of described phenomenon? Is it only a new way of expressing a psychopathology typical for adolescents, which gained a new, virtual dimension, whose dynamic development makes it more and more inaccessible to the staff caring for adolescent patients? Is it not significant that the Instagram profile URLs on the walls were spotted among the graffiti by medical students rather than the Unit older staff for whom these inscriptions remained unrecognized? It is known that Instagram has introduced a help system for users – an attempt to tag or search for phrases related to e.g. suicide or self-harm will result in the display of a simple message and an algorithm that can be used to get help in crisis [35–39]. However, it remains unknown whether such preventive methods are sufficiently effective. Social media also fail to consult specialists in this respect (e.g. in Europe only specialists from the United Kingdom and Bulgaria have been consulted). Not enough research on the subject is conducted. There are studies on the possibility of assessing personality traits [26, 40, 41] and detecting the increased risk of symptoms of depression [42, 25] based only on social media content, but they are not sufficiently focused and, although very promising, require more in-depth research. A separate question is to what extent obtaining information from the Internet can be a part of a psychiatric examination. It is obvious that in an inpatient clinic important information about patients is collected by observing their interactions with others. Should then the virtual space be treated as private space which we should not access or as social space which could be a part of the examination, e.g. in the form of an active question examining social media activity and, optionally, with the patient’s consent, looking at the published content together with the patient? On the one hand it is known that obtaining information about the patient from sources other than a direct conversation may have negative implications. On the other hand, however, does looking at the patient’s social media profile together with her/him fall into the same category?

An interesting finding was also the fact that there were no negative comments under analyzed posts. Our hypothesis is that such profiles are viewed mainly by people with similar experiences and difficulties to the profile own-

ers. It may therefore be the result of subcultural loyalty and/or fear of hurting or criticizing a person with similar symptoms to the one who comments it. The commenters may also fear a negative assessment when he or she publishes a post with similar content.

It is possible that by the time this paper is published it will have partly lost its currency, because what is characteristic of teenagers' Internet activity has its very dynamic changeability. Research on mutual influence of social media and psychology, especially in adolescents, should be frequently updated and analyzed in many contexts, so that the major trends in the changes of this influence and its understanding in the context of child and adolescent psychiatry can be identified. The ethicality of analyzing patients' Instagram profiles was discussed but it was finally decided that revealing the URLs on the walls of the Unit constituted a form of the patients' public expression, which was also in many cases anonymous, and that the cognitive and behavioural analysis therefore seems to be of clinical importance. The analysis was performed by members of the Child and Adolescent Psychiatry Student Research Group, which meant that the analyzed content of the patients' Instagram profiles did not influence the work conducted by doctors and therapists with their patients. To make the identification of the patients impossible, all their personal details appearing in the content quoted in the paper have been altered.

The study had a rather naturalistic character (researchers had no influence on the selection of the group creating the analyzed content). This circumstance is one of the limitations of the study, making it impossible to closely link the research material with the psychopathology of specific patients.

## CONCLUSIONS

The collected data shows that the content published by the patients of the Unit goes along with the results of other studies, which proved the negative consequences of using social media for the mental health, especially of teenagers after suicide attempts who face increased suicidal thoughts. It seems critically important to continue to research the influence of social me-

dia on children and adolescents and the symptoms of illness, to analyze the Internet activity of people suffering from mental disorders and to search for possible Internet-related methods of preventing the disorders. It is also very important to create universal and effective guidelines for psychoeducation and social movements and to attempt to create a safe space for teenagers, where they could share their experiences, also online, which can greatly influence adolescents' mental health.

In the current reality, where a significant part of the interaction and social life of a teenager may take place on the Internet, it seems necessary to extend the psychiatric examination of an adolescent with a detailed interview focused on their functioning in social media.

So far there has been a lack of sufficient data concerning the Internet activity of people suffering from mental disorders. The association found in the study shows that conducting further research in this field may be of scientific and clinical importance.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

## REFERENCES

1. Pew Research Center. Teens, social media & technology 2018 [homepage on the Internet]. United States: Anderson M, Jiang J; [updated 2018, May, 31; cited 2020, Jan 7]. Available from: <https://www.pewresearch.org/internet/2018/05/31/teens-socialmedia-technology-2018/>
2. Newberry C. 22+ Instagram stats that marketers can't ignore this year [homepage on the Internet]. International: Newberry C; [updated 2019 Oct 22; cited 2020 Jan 7]. Available from: <https://blog.hootsuite.com/instagram-statistics/>
3. Pew Research Center. Teens, social media & technology overview 2015 [homepage on the Internet]. United States: Lenhart A; [updated 2015 Apr 9; cited 2020 Jan 7]. Available from: <https://www.pewresearch.org/internet/2015/04/09/teens-socialmedia-technology-2015/>
4. Merikangas KR, Nakamura EF, Kessler RC. Epidemiology of mental disorders in children and adolescents. *Dialogues Clin Neurosci*. 2009; 1(1): 7.
5. Avenevoli S, Swendsen J, He JP, Burstein M, Merikangas KR. Major depression in the national comorbidity survey-adolescent supplement: Prevalence, correlates, and treatment. *J Am Acad Child Adolesc Psychiatry*. 2015; 54(1): 37-44.



6. Del Vecchio P. The good news about preventing adolescent depression. *Prev Sci*. 2018; 19(1): 112–114.
7. Dhir A, Yossatorn Y, Kaur P, Chen S. Online social media fatigue and psychological wellbeing – A study of compulsive use, fear of missing out, fatigue, anxiety and depression. *Int J Inf Manage*. 2018; 40: 141–152.
8. Elhai JD, Tiamiyu M, Weeks J. Depression and social anxiety in relation to problematic smartphone use: The prominent role of rumination. *Internet Research*. 2018; 28(2): 315–332.
9. Frison E, Eggermont S. Browsing, posting, and liking on Instagram: The reciprocal relationships between different types of Instagram use and adolescents' depressed mood. *Cyberpsychol Behav Soc Netw*. 2017; 20(10): 603–609.
10. Hunt MG, Marx R, Lipson C, Young J. No more FOMO: Limiting social media decreases loneliness and depression. *J Soc Clin Psychol*. 2018; 37(10): 751–768.
11. Lemola S, Perkinson-Gloor N, Brand S, Dewald-Kaufmann JF, Grob A. Adolescents' electronic media use at night, sleep disturbance, and depressive symptoms in the smartphone age. *J Youth Adolesc*. 2015; 44(2): 405–418.
12. Levenson JC, Shensa A, Sidani JE, Colditz JB, Primack BA. The association between social media use and sleep disturbance among young adults. *Prev Med*. 2016; 85: 36–41.
13. Lin LY et al. Association between social media use and depression among US young adults. *Depress Anxiety*. 2016; 33(4): 323–331.
14. Lup K, Trub L, Rosenthal L. Instagram# instasad?: exploring associations among Instagram use, depressive symptoms, negative social comparison, and strangers followed. *Cyberpsychol Behav Soc Netw*. 2015; 18(5): 247–252.
15. Twenge JM, Joiner TE, Rogers ML, Martin GN. Increases in depressive symptoms, suicide-related outcomes, and suicide rates among US adolescents after 2010 and links to increased new media screen time. *Clin Psychol Sci*. 2018; 6(1): 3–17.
16. Yoon S, Kleinman M, Mertz J, Brannick M. Is social network site usage related to depression? A meta-analysis of Facebook-depression relations. *J Affect Disord*. 2019; 248: 65–72.
17. O'Keeffe GS, Clarke-Pearson K. The impact of social media on children, adolescents, and families. *Pediatrics*. 2011; 127(4): 800–804.
18. Royal Society for Public Health & Young Health Movement. #StatusOfMind: Social media and young people's mental health and wellbeing [homepage on the Internet]. United Kingdom: [updated 2017 Oct 18; cited 2020 Jan 7]. Available from: <https://www.rsph.org.uk/our-work/campaigns/status-of-mind.html>
19. Casale S, Gemelli G, Calosi C, Giangrasso B, Fioravanti G. Multiple exposure to appearance-focused real accounts on Instagram: Effects on body image among both genders. *Curr Psychol*. 2019: 1–10.
20. Mohr CJ. Identity and the life cycle: Selected papers. By Erik H. Erikson. With a historical introduction by David Rapaport. New York: International Universities Press, Inc.; 1959.
21. Steinberg L, Morris AS. Adolescent development. *Annu Rev Psychol*. 2001; 52(1): 83–110.
22. Litt E. Knock, knock. Who's there? The imagined audience. *J Broadcast Electron Media*. 2012; 56(3): 330–345.
23. Clark, B. The methodology behind representing self: the role of Instagram in identity formation. Oral and written presentation on 2018 Apr 14 at South Carolina Junior Academy of Science. 98.
24. Lee E, Lee JA, Moon JH, Sung Y. Pictures speak louder than words: Motivations for using Instagram. *Cyberpsychol Behav Soc Netw*. 2015; 18(9): 552–556.
25. Yau JC, Reich SM. "It's just a lot of work": adolescents' self presentation norms and practices on Facebook and Instagram. *J Res Adolesc*. 2019; 29(1): 196–209.
26. Ferwerda B, Tkalcic M. You are what you post: What the content of Instagram pictures tells about users' personality. Presented on 2018 Mar 7-11 in The 23rd International on Intelligent User Interfaces in Tokyo, Japan.
27. Andalibi N, Ozturk P, Forte A. Sensitive self-disclosures, responses, and social support on Instagram: the case of #depression. In Proceedings of the 2017 ACM conference on computer supported cooperative work and social computing. 2017; pp. 1485–1500.
28. Brown RC, Fischer T, Goldwisch AD, Keller F, Young R, Plenier PL. #cutting: Non-suicidal self-injury (NSSI) on Instagram. *Psychol Med*. 2018; 48(2): 337–346.
29. Carlyle KE, Guidry JP, Williams K, Tabaac A, Perrin PB. Suicide conversations on Instagram: contagion or caring?. *J Commun Healthc*. 2018; 11(1): 12–18.
30. Sherman LE, Greenfield PM, Hernandez LM, Dapretto M. Peer influence via Instagram: effects on brain and behavior in adolescence and young adulthood. *Child Dev*. 2018; 89(1): 37–47.
31. Liberatore KA, Rosario K, Martí LN, Martínez KG. Prevalence of Internet addiction in Latino adolescents with psychiatric diagnosis. *Cyberpsychol Behav Soc Netw*. 2011; 14(6): 399–402.
32. Müller KW, Ammerschlaeger M, Freisleder FJ, Beutel ME, Woelfling K. Addictive internet use as a comorbid disorder among clients of an adolescent psychiatry-prevalence and psychopathological symptoms. *Z Kinder Jugendpsychiatr Psychother*. 2012; 40(5): 331–7.
33. Krzykawska K, Polańska A. Uzależnienie od nowych mediów wśród młodzieży zgłaszającej się na konsultację psychiatryczną. [New media addiction among young people seeking psychiatric consultation]. Oral presentation in

- 2017 on the Conference: Behavioral Addictions, Cracow, Poland [unpublished results]
34. Łucka I et al. Multidyscyplinarny system leczenia stacjonarnego dzieci i młodzieży. [Multidisciplinary in-patient treatment system for children and adolescents]. *Psychiatria*. 2008; 5(3): 105–110.
  35. Facebook. Building a safer community with new suicide prevention tools [homepage on the Internet]. International: Callison-Burch V, Guadagno J, Davis A; [updated 2017 Mar 1; cited 2020 Jan 7]. Available from: <https://newsroom.fb.com/news/2017/03/building-a-safer-community-with-new-suicide-prevention-tools/>
  36. Facebook. Hard questions: is spending time on social media bad for us? [homepage on the Internet]. International: Ginsberg D, Burke M; [updated 2017 Dec 15; cited 2020 Jan 7]. Available from: <https://newsroom.fb.com/news/2017/12/hard-questions-is-spending-time-on-social-media-bad-for-us/>
  37. Instagram. Changes we're making to do more to support and protect the most vulnerable people who use Instagram [homepage on the Internet]. International: Mosseri A; [updated 2019 Feb 7; cited 2020 Jan 7]. Available from: [https://](https://about.instagram.com/blog/announcements/supporting-and-protecting-vulnerable-people-on-instagram)
  38. Facebook. Partnering with experts to protect people from self-harm and suicide [homepage on the Internet]. International: Davis A; [updated 2019 Feb 7; cited 2020 Jan 7]. Available from: <https://newsroom.fb.com/news/2019/02/protecting-people-from-self-harm/>
  39. Facebook. How Facebook AI helps suicide prevention [homepage on the Internet]. International: Card C; [updated 2018 Sep 10; cited 2020 Jan 7]. Available from: <https://newsroom.fb.com/news/2018/09/inside-feed-suicide-prevention-and-ai>
  40. Jackson CA, Luchner AF. Self-presentation mediates the relationship between self-criticism and emotional response to Instagram feedback. *Pers Individ Dif*. 2018; 133: 1–6.
  41. Lay A, Ferwerda B. Predicting users' personality based on their 'liked' images on Instagram. Presented on 2018 Mar 7-11 in The 23rd International on Intelligent User Interfaces in Tokyo, Japan.
  42. Reece AG, Danforth CM. Instagram photos reveal predictive markers of depression. *EPJ Data Sci*. 2017; 6(1): 15.