Addictive Behaviors Reports 22 (2025) 100629

Contents lists available at ScienceDirect

Addictive Behaviors Reports

journal homepage: www.elsevier.com/locate/abrep

Short Communication

Does the unavailability of social media affect online gambling behavior? A behavioral tracking data study before and after the October 2021 Facebook outage

Andrea Czakó [a,b], Cristina Villalba-García [a], Tamás Ferenci [c,d], Laura Maldonado-Murciano [e], Carrie A. Shaw [f], Mark D. Griffiths [g], Zsolt Demetrovics [a,b,h,*]

[a] Centre of Excellence in Responsible Gaming, University of Gibraltar, Gibraltar, Gibraltar
[b] Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary
[c] Physiological Controls Research Center, Obuda University, Budapest, Hungary
[d] Department of Statistics, Corvinus University of Budapest, Budapest, Hungary
[e] Department of Psychology, Universitat Internacional de Catalunya, Spain
[f] Department of Psychology, University of Alberta, Edmonton, AB, Canada
[g] International Gaming Research Unit, Psychology Department, Nottingham Trent University, Nottingham, United Kingdom
[h] Flinders University, Institute for Mental Health and Wellbeing, College of Education, Psychology and Social Work, Flinders University, Bedford Park, South Australia, Australia

ARTICLE INFO

Keywords:
Social media use
Social media outage
Gambling
Online gambling
Behavioral tracking

ABSTRACT

Background and aims: Social media platforms have become important in both individuals' personal lives and for commercial organizations (e.g., online gambling operators). However, no previous study has examined how the unavailability of social media affects online gambling. A 6-hour-long worldwide outage of *Facebook* on October 4, 2021 created a unique possibility to investigate this relationship. The present study examined whether patterns of online gambling were different during the time of the social media outage from what could be expected during that time based on historical behavioral tracking data.
Methods: The study used a dataset provided by *Fortuna Entertainment Group* that included information on the gambling behavior of 232,037 individuals from Croatia, Czechia, Poland, Romania, and Slovakia on five consecutive Mondays, including the day of the social media outage, on two different types of gambling activity: gaming (such as online casino games) and sports betting. A linear regression was estimated for several outcome variables (number of people gambling, amount of stake, number of bets) separately for each country and gambling type, while gender, age, time, and date were included as control variables.
Results: Most of the regressions showed a non-significant impact of the outage, and only a few significant (but small) differences were identified where the outage was associated with a lower outcome. In the case of the examined countries, the *Facebook* outage only had a marginal impact on gambling behavior.
Discussion and Conclusions: Further research and analysis are needed to explore the relationship between social media use and online gambling behavior.

1. Introduction

Social media has been defined as web-based communication platforms that allow individuals to create unique profiles and visible network connections while interacting and sharing content with others. In turn, these online portals constitute a popular space for broadcasting content and consuming information in a continuous and updated stream of data (Ellison & Boyd, 2013). The number of social media users worldwide increased by 241 million over the past year, reaching a total of more than 5.3 billion individuals – two-thirds of the global population

* Corresponding author at: Flinders University, Institute for Mental Health and Wellbeing, College of Education, Psychology and Social Work, Flinders University, Bedford Park, South Australia, Australia.
E-mail address: zsolt.demetrovics@gmail.com (Z. Demetrovics).

https://doi.org/10.1016/j.abrep.2025.100629
Received 8 February 2025; Received in revised form 1 August 2025; Accepted 1 September 2025
Available online 2 September 2025

– who accessed social networking websites in 2025 (DataReportal, 2025). As for the most visited social networking sites, *Facebook* maintained its top spot, with more than 3 billion monthly users, having been widely accessible for over 15 years. This is followed by *YouTube*, *Instagram*, and *WhatsApp* in second, third, and fourth place respectively (Statista, 2025).

Individuals use social media daily to fulfill necessities such as communicating, entertainment, searching for information and/or doing business (Moretta et al., 2022; Zhang et al., 2022). Platforms, such as *Facebook, WhatsApp,* or *Instagram,* supply an ideal environment for users to fulfill these personal needs simply by setting up a free account. More specifically, *Facebook* offers a semi-public space where users can safely manage their private social lives and run their businesses. *WhatsApp* is a private platform where individuals interact with close contacts (Gazit & Aharony, 2018). *Instagram* is a public virtual space intended mainly for photo-sharing (Waterloo et al., 2018). Unsurprisingly, social networks not only cover individual demands but can be used by commercial industry to reach potential customers. For instance, popular gambling brands broadcast messages embedding ads into social media users' news feeds, stories, or in the animation of official pages by virtue of community managers such as *Facebook* or *Instagram* (Gainsbury et al., 2015; Killick & Griffiths, 2020). Moreover, a recent systematic review reported that operators had developed gendered marketing strategies using social media portals to influence gamblers' behaviors (Guillou-Landreat et al., 2021).

On Monday October 4, 2021, there was an unanticipated, approximately six-hour-long worldwide outage of *Facebook* and its subsidiary platforms (*WhatsApp, Instagram, Messenger*) (Madory, 2021). This outage affected a billion social media users' lives, some of whom reported discomfort, boredom, annoyance, and/or a feeling of separation from the world (Shousha, 2021). Similarly, this isolated episode affected large companies because billions of customers were unable to access their accounts and the resources they typically reach through these platforms, such as advertisements or links to external pages (Isaac & Frenkel, 2021).

For researchers, this outage presented an unprecedented opportunity to examine the spontaneous and unpredictable behavioral changes caused by social media abstinence (Shousha, 2021). Among other psychological phenomena, some authors have conducted research studying users' reactions towards this major social media outage (Liao & Sundar, 2022), investigating how changes in individuals' mood may be related to involuntary interrupted access to social media (Sekścińska & Jaworska, 2022) or identified factors explaining the distinct levels of stress individuals experienced during this interruption (Eitan & Gazit, 2023).

The present authors assumed that online gambling could either increase or decrease during the investigation time period. Given the disruption to *Facebook's* operations, some users may have replaced one online behavior (e.g., use of *Facebook* and/or its subsidiary platforms) with another (e.g., gambling), with online gambling serving as an alternative outlet (i.e., digital behavior substitution). Previous research has found that addiction substitution (i.e., behavioral substitution, sometimes referred to as 'reciprocity' [Griffiths, 2017]) can actually occur when individuals, during or after recovery from a gambling disorder, increase their engagement in an alternative addictive behavior, such as videogame playing (e.g., Horvath, 2006). During the COVID-19 pandemic, this behavioral substitution effect has also been investigated, with some authors reporting an increase in the prevalence and expenditure in online gambling (e.g., Fluharty, Paul, & Fancourt, 2022; Georgiadou et al., 2022; Shaw et al., 2022).

Moreover, some individuals may have felt a disruption in their online routines due to being unable to access their accounts (*Facebook* and/or its subsidiary platforms), which could have led them to engage in other similar online behaviors (such as online gambling) to avoid widespread disruption in their online behaviors. In fact, frequent gambling (including online gambling) can eventually become a routine part of an individual's daily life (e.g., Cotte & LaTour, 2009; Lam & Mizerski, 2009) as has been observed in relation to the use of social media platforms. Individuals often rely on social networks to regulate their emotions or escape from reality (e.g., Young, 2017). Therefore, it is possible that in the absence of specific social platforms, users may have engaged in other online behaviors (e.g., online gambling) to meet similar needs (e.g., Neophytou et al., 2023). Alternatively, given that gambling operators use *Facebook* and other social media platforms to reach users directly and advertise gambling (Singer et al., 2024), it is also possible that a temporary absence of gambling advertisements could have resulted in a lower level of gambling activities. However, to the best of the present authors' knowledge, no previous study has examined how this unavailability of social media portals affected online gambling behavior.

Therefore, the present study examined whether the patterns of online gambling differed during the time of the worldwide social media outage from what could be expected during that time based on behavioral tracking data provided by an online gambling operator. In the present study, the behavioral tracking data comprised account-based objective data provided by an online gambling operator. Such data provide actual gambling behavior (number of individuals gambling online, amount of money staked, time of gambling, and the number of bets made) by real gamblers in real time on an online gambling platform. The approach taken mirrors previous research using such data, which examined gambling behavior before and after a specific unexpected external event. For example, research has investigated whether online gambling behavior changed before and during the COVID-19 pandemic using behavioral tracking data provided by online gambling operators (Auer & Griffiths, 2022; Auer et al., 2023).

Interestingly, during the COVID-19 pandemic, among other relevant findings, a significant decrease in the amount of money wagered by sport bettors was observed (Auer et al., 2023). Moreover, it was found that gambling intensity actually decreased during the COVID-19 pandemic at least among Swedish online gamblers (Auer & Griffiths, 2022). Although the *Facebook* (and its subsidiary platforms) outage lasted approximately six hours, this global disruption still affected a large number of online social media users and gambling companies. Therefore, this brief interruption could have led to a change in individuals' gambling patterns, such as in the amount of money wagered, the time spent gambling, or/and the number of bets placed.

To increase the relevance of the data analysis, five European countries (Croatia, Czech Republic, Poland, Romania, and Slovakia) were selected, because in the time zones of these countries most of the *Facebook* outage took place during the daily gambling peak-time (i.e., in the afternoon and evening) (Nower et al., 2017). In the selected countries, online gambling has a high market share of the total gambling revenue (European Gaming and Betting Association [EGBA], 2025). In four out of the five countries (Poland, Croatia, Czech Republic, and Slovakia), more than half of all gambling revenue originates from its online form (EGBA, 2025). In terms of revenue, casino games and sports betting are the most prominent forms of online gambling in all five countries, with some regional differences. For instance, comparing the revenue from different forms of online gambling products, in Poland and Slovakia, sports betting is the most preferred form of online gambling, while in Croatia, the Czech Republic and Romania, online casino games generate the highest revenue. (EGBA, 2025).

2. Methods

2.1. Participants and procedures

The data used in the present study was a secondary dataset provided by the *Fortuna Entertainment Group* (FEG). For comparability, the study used behavioral tracking data from five consecutive Monday afternoons/evenings: the Monday when the outage occurred (October 4, 2021), the two Mondays prior to the social media outage (September 20 and September 27) and the two Mondays following the social media

outage (October 11 and October 18). Two different types of gambling activity, gaming (such as online casino games) and sports betting, were analyzed on these days, considering the time period between 12 pm (midday) and 12 am (midnight) in 30-minute intervals. The data were stratified according to country, gambling type (vertical), gender, and age group, with the aggregate number of individuals gambling, stakes, and number of bets (among other variables) available in each stratum for each half-hour-long segment. The final sample obtained from the *FEG* was 21,965 strata with a total of 1,319,236 data points from 232,037 individuals who gambled across five different countries (Croatia, Czechia [Czech Republic], Poland, Romania, and Slovakia) (Table 1).

2.2. Measures

Sociodemographic and gambling-related behavioral tracking data were obtained from the *FEG* dataset. In terms of sociodemographics, information regarding gender and age was available. Regarding gambling behavior, data were available on the number of individuals gambling online in each country, amount of money staked, time of gambling, and the number of bets made.

2.3. Statistical analyses

In order to investigate if there was any change during the social media outage in the number of individuals gambling online, the amount of money staked, and the number of bets made, a linear regression was estimated for each outcome variable, separately for outcome, country and vertical (gaming [i.e., online casino games] and sports betting). Linear regression was used because all outcomes were continuous variables, having positive values. They were all highly right-skewed. Linear regression was used due to the very large sample size: at this size (several thousand participants) distribution is no longer relevant with respect to the properties of ordinary least squares (OLS) estimator, a fundamental method in statistical modeling used to estimate linear relationships between variables, because central limit theorem applies, and the estimates are unbiased (assuming no uncontrolled confounders) and efficient. Models were estimated with the usual OLS estimator and included gender, age, time, and date as control variables in addition to the social media outage indicator. Time was expanded with a restricted cubic spline to allow a potential non-linear effect. The date was entered as a categorical covariate (i.e., each date had a separate effect). No interaction was allowed between the predictor variables (Harrell Jr, 2015). The analyses were done using the software R (R Core Team, 2022) package rms version 6.4–1 (Harrell Jr, 2018).

2.4. Ethics

The study procedures were carried out in accordance with the Declaration of Helsinki. The study was approved by the first author's university ethics committee.

3. Results

Most participants were from Poland (46.1 %), followed by Czech Republic (21.9 %), Slovakia (15.5 %), Romania (9.6 %), and Croatia (6.8 %). More males (76.2 %) than females were in the sample, and the majority of the participants were aged between 31 and 65 years (59.2 %) (Table 1).

A few tendencies were unambiguous across countries in relation to both outcomes (i.e., number of individuals gambling, stake amount, and number of bets), and verticals (i.e., gaming and sports). First, the male gender was almost always associated with higher outcomes, and the difference was both statistically significant and substantial in magnitude. The time pattern (pattern over a day) was also very stable both for the number of individuals and the number of bets (for both verticals), with a peak around 8 pm and a trough around midnight (again, this was almost always significant). However, the amount of money staked was much more constant over time, but a peak around 8 pm could still be observed in some cases. Finally, higher age was almost invariably associated with lower outcomes, but those online gamblers in the 25–45 years age band had higher values on the aforementioned outcomes compared to both the younger and older age groups).

The results of the effect of the social media outage are shown in Table 2. Most of the regressions showed a non-significant impact of the outage most of the time. Only a few significant effects were identified. Among Croatian gamblers, the number of gaming bets made ($p = 0.03$) and the number of sports bettors ($p = 0.03$) were lower during the time of the outage. Similarly, among Polish gamblers, lower values were identified regarding the number of sports bettors ($p = 0.03$) and the amount of money staked by sports bettors ($p = 0.01$). In all of these cases, the social media outage was associated with lower outcomes, but the differences were small. When multiple comparisons are taken into account, this suggests a marginal impact of the social media outage, despite the fact that the large sample size allowed a relatively precise estimation of the effects.

4. Discussion

The unprecedented worldwide social media outage in October 2021 of all *Facebook*-owned social media platforms provided a unique opportunity for researchers to examine the impact of the loss of social networking opportunities on individuals' lives. The present study took

Table 1
Gender and age information of the individuals who gambled by country.

	Croatia n = 15,843	Czech Republic n = 50,864	Poland n = 106,916	Romania n = 22,375	Slovakia n = 36,039	Total n = 232,037
Gender						
Female	2,391 (15.09 %)	5,677 (11.16 %)	4,494 (4.20 %)	3,565 (15.93 %)	4,077 (11.31 %)	20,204 (8.71 %)
Male	11,994 (75.71 %)	44,205 (86.91 %)	72,365 (67.68 %)	18,809 (84.06 %)	29,454 (81.73 %)	176,827 (76.21 %)
Null*	1,458 (9.20 %)	982 (1.93 %)	30,057 (28.11 %)	1 (<0.01 %)	2,508 (6.96 %)	35,006 (15.09 %)
Age band (in years)						
≥ 30	7,339 (46.32 %)	14,726 (28.95 %)	47,363 (44.30 %)	7,041 (31.47 %)	11,075 (30.73 %)	87,544 (37.73 %)
31–65	8,330 (52.58 %)	33,349 (65.57 %)	57,252 53.55 %)	15,096 (67.47 %)	23,409 (64.96 %)	137,436 (59.23 %)
>65	174 (1.10 %)	2,789 (5.48 %)	2,301 (2.15 %)	238 (1.06 %)	1,555 (4.31 %)	7,057 (3.04 %)

* The null value represents no gender information of the participant.

Table 2
Results of the OLS regression related to the outage day.

Country	Vertical	Type	Effect	CI lower	CI upper	*p*
Croatia	Gaming	Number of individuals gambling	−0.88	−3.05	1.29	0.43
		Stake amount	−2498.10	−7627.71	2631.51	0.34
		Number of bets	−504.90	−962.01	−47.79	**0.03***
	Sports	Number of individuals gambling	−2.54	−4.84	−0.25	**0.03***
		Stake amount	−227.38	−855.50	400.73	0.48
		Number of bets	−2.86	−6.26	0.55	0.10
Czechia	Gaming	Number of individuals gambling	1.70	−5.00	8.40	0.62
		Stake amount	40876.42	−6021.30	87774.14	0.09
		Number of bets	−54.78	−1095.98	986.42	0.92
	Sports	Number of individuals gambling	−10.47	−28.82	7.88	0.26
		Stake amount	2915.71	−29438.34	35269.77	0.86
		Number of bets	−13.83	−49.13	21.48	0.44
Poland	Gaming	Number of individuals gambling	0.21	−0.13	0.54	0.23
		Stake amount	43.58	−102.47	189.63	0.56
		Number of bets	2.25	−0.34	4.84	0.09
	Sports	Number of individuals gambling	−18.99	−36.61	−1.36	**0.03***
		Stake amount	−1046.78	−1856.24	−237.33	**0.01****
		Number of bets	−12.42	−44.08	19.23	0.44
Romania	Gaming	Number of individuals gambling	−4.57	−11.20	2.05	0.18
		Stake amount	−2118.39	−7162.71	2925.92	0.41
		Number of bets	−609.56	−2014.54	795.42	0.39
	Sports	Number of individuals gambling	−11.07	−22.34	0.21	0.05
		Stake amount	−691.04	−1943.95	561.88	0.28
		Number of bets	−13.34	−49.40	22.72	0.47
Slovakia	Gaming	Number of individuals gambling	2.11	−2.34	6.55	0.35
		Stake amount	−227.48	−1452.45	997.50	0.72
		Number of bets	−129.02	−922.70	664.65	0.75
	Sports	Number of individuals gambling	−7.96	−22.06	6.14	0.27
		Stake amount	−330.57	−942.90	281.77	0.29
		Number of bets	−8.41	−37.55	20.72	0.57

* $p < 0.05$, ** $p < 0.01$.

advantage of this event to explore how the lack of access to some of the most popular social media platforms impacted online gambling behavior in a similar way to other behavioral tracking research examining the impact of other unprecedented events (e.g., the COVID-19 pandemic) on gambling behavior (e.g., Auer & Griffiths, 2022; Auer et al., 2023).

More specifically, the objective was to examine whether online gambling patterns were different during the global social media outage by comparing gambling behavior on the day of the outage (Monday, October 4, 2021), with gambling activity on four other Mondays either side of it. To do this, the behavioral tracking data of gamblers from five countries were analyzed. To study changes in gambling behavior during the social media outage compared to an average Monday, the study examined quantitative data including the number of gamblers, the amount of money staked, and the total number of bets over half-hour-long time segments between 12 pm midday and 12am midnight (which includes both the period of the outage and also some time before and after it).

In most cases, no significant effects of the outage were found. Significant differences were only observed in a few cases among the gamblers from two countries. More specifically, among (i) Croatian gamblers, there was a lower number of gaming bets made and a lower number of sports bettors, and (ii) Polish gamblers, there was a lower number of sports bettors and a lower amount of money staked by sports bettors. In these cases, the social media outage was associated with slightly lower gambling activity than usual. Considering the findings as a whole, the results tentatively suggest the social media outage had only a marginal impact on gambling behavior, at least on this gambling operator's platform and in these five countries. There are no obvious explanations for these findings and may have simply been due to multiple comparisons. Also, large sample sizes made the tests powerful, for instance, half of the gamblers in the database were Polish sport bettors, so the significant difference may have been due to the much bigger sample size.

As other research has noted, this global outage of leading social media platforms had a great and unexpected short-lived impact on the lives of billions of individuals (Sekścińska & Jaworska, 2022). Given the lack of access to their *Facebook, WhatsApp* and/or *Instagram* accounts, during these hours, some individuals looked for other online platforms such as *Twitter* to spend their time on (Massie, 2021). According to media system dependence theory (MSDT) (Kim, 2020), individuals tend to use the mass media for news or information. This theory states that the impact of the media is magnified during periods of uncertainty or ambiguity (such as a sudden *Facebook* outage) (e.g., Liao, 2025). Therefore, it is possible that users in the present study used alternative social media platforms (e.g., *Twitter*) that were still active during the outage rather than other online/offline behaviors. It was reported that many users expressed discomfort and despair over this temporary blackout, while others felt relieved (Shousha, 2021). Consequently, the range of alternative online and offline activities chosen to engage in during these hours without access to popular social media platforms appears to have been diverse and disparate among individuals.

The present study has a number of limitations. Although the authors had access to behavioral tracking data provided by a leading betting operator from 232,037 individuals who gambled across five countries, there was no access to data from other operators, or to any complementary data, such as data regarding the activities that gamblers carried out during the outage or data concerning their usual patterns of social media use, that would help further understanding the association between the absence of social media and gambling behavior. It should be noted that the results were based on data from a single operator covering only five European countries, which may limit the generalizability of these findings to other contexts or samples. Moreover, future studies could benefit from user-level analysis of variance, because in the present study, the tracking data used were aggregated.

It is also possible that individuals were still exposed to gambling advertisements through other social media platforms (e.g., *Twitter*), which could also be relevant in driving gambling behavior, where many users spent time during the outage posting both negative and positive impacts under the hashtag #facebookdown (Liao & Sundar, 2022). Conducting an analysis of sentiments over more than 60,000 tweets, it

was shown that *Twitter* followers can potentially be exposed to hundreds of messages from major gambling brands every day, increasing their chances of engaging with gambling (Bradley & James, 2019; Killick & Griffiths, 2020). It should also be noted that the results could also have been affected by the length of the outage (only six hours), a brief period of time to demonstrate any effects, and with a longer outage, the results would have likely been different.

Although the research team had account-specific data, it is possible that in some cases multiple individuals within a household use one single account (e.g., a husband and wife using the same account to gamble), therefore data regarding gambling behaviors might not be individual-specific. In the case of those who regularly gamble, it could be alternatively interpreted that their gambling behavior was not related to their social media use, therefore not affected by the outage. Further research and analysis are needed to explore these background factors and fully understand the relationship between social media use and gambling behavior. Similarly, future research should investigate whether specific groups of users (e.g., younger users, individuals belonging to specific online communities) may be more affected by interruptions or limited access to specific social media platforms.

Funding Information

ZD's contribution was supported by the Hungarian National Research, Development and Innovation Office (KKP126835).

CRediT authorship contribution statement

Andrea Czakó: Writing – review & editing, Writing – original draft, Project administration, Methodology, Conceptualization. **Cristina Villalba-García:** Writing – review & editing, Writing – original draft. **Tamás Ferenci:** Writing – review & editing, Methodology, Formal analysis, Data curation. **Laura Maldonado-Murciano:** Writing – review & editing, Writing – original draft. **Carrie A. Shaw:** Writing – review & editing, Methodology, Conceptualization. **Mark D. Griffiths:** Writing – review & editing. **Zsolt Demetrovics:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Funding acquisition, Conceptualization.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Zsolt Demetrovics reports financial support was provided by Hungarian National Research, Development and Innovation Office.

Zsolt Demetrovics reports administrative support *(the behavioural tracking dataset used in this research)* was provided by Fortuna Entertainment Group (FEG) and Crucial Compliance Limited.

The University of Gibraltar receives funding from the Gibraltar Gambling Care Foundation, an independent, not-for-profit charity. MDG's university has received research funding from Norsk Tipping (the gambling operator owned by the Norwegian Government). MDG has also received funding for a number of research projects in the area of gambling education for young people, social responsibility in gambling and gambling treatment from Gamble Aware (formerly the Responsible Gambling Trust), a charitable body which funds its research program based on donations from the gambling industry. MDG regularly undertakes consultancy for various gambling companies in the area of social responsibility in gambling. None of the above-listed funding sources are related to this article, and the funding institutions had no role in the study design or the collection, analysis, and interpretation of the data, writing the manuscript, or the decision to submit the paper for publication. Sources of funding are acknowledged.

Given their role as Editorial Board members, Griffiths M.D. and Demetrovics Z. had no involvement in the peer-review of this article and had no access to information regarding its peer-review.

All other authors declare that they have no conflicts of interest, and no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

The authors would like to thank *Fortuna Entertainment Group* (*FEG*) and *Crucial Compliance Limited* for providing the behavioural tracking dataset used in this research.

Data availability

Aggregated data will be made available upon reasonable request.

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