Research article

Frequency of probable social media addiction and correlates of problematic social networking sites use in a sample of transgender adults

Katharina Grupp [a], Marco Blessmann [a], Hans-Helmut König [b], André Hajek [b,*]

[a] *Division of Plastic, Reconstructive and Aesthetic Surgery, University Medical Center Hamburg-Eppendorf, Martinistr. 52, 20246, Hamburg, Germany*
[b] *Department of Health Economics and Health Services Research, University Medical Center Hamburg-Eppendorf, Hamburg Center for Health Economics, Martinistr. 52, 20246, Hamburg, Germany*

A B S T R A C T

Aim: Transgender people face many unique challenges. Thus, some of them report excessive use of social media. Our aim was to identify the frequency of social media addiction and to investigate the factors associated with problematic social networking sites use exclusively amongst transgender adults in times of the Covid-19 pandemic.
Subjects: We used data from the "Transgender Survey" HH-TPCHIVG ($n = 104$ in the analytical sample). Transgender people from self-help groups were involved in gathering information about gender-affirming surgery at a German hospital were included. Specific exclusion criteria did not exist. The validated Bergen Social Media Addiction Scale served as a tool to quantify probable social media addiction.
Results: In sum, 20.5 % of the transgender people are probably addicted to social media. Regressions showed that problematic social networking sites use was significantly positively associated with the presence of a migration background ($\beta = 2.41$, $p < 0.05$), and a higher frequency of sports activities.
Conclusion: In conclusion, our study stressed the challenge of probable social media addiction among transgender people. Knowledge about the correlates of problematic social networking sites use may assist in addressing individuals at risk. The associations identified in this study could be explained, by, among other things, body dissatisfaction (especially with regard to sporting activities) or increased internet contacts (for people with a migration background). Efforts to reduce social media addiction (e.g., awareness-raising, promotion of offline activities, using role models) could prove effective in this group, pending longitudinal research.

1. Introduction

The social majority is cisgender. They are defined by gender identities or expressions that align with the sex they were assigned at birth [1]. In contrast, transgender individuals reflect a gender minority, as their identities or expressions do not correspond to the sex

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assigned to them at birth [1]. Some transgender people may exclusively identify with the "opposite" sex, whereas others may identify with both genders or neither [1].

The prevalence of negative mental outcomes is significantly higher in the subset of transgender people compared with their heterosexual peers [2,3]. Family, friends, as well as society acceptance are linked to increased mental health and well-being in transgender [4,5]. Transgender individuals have a tendency towards reliance on other transgenders for assistance to improve mental health and well-being [6,7] and have been associated with an increased use of social media compared to their heterosexual counterparts [8]. Moreover, transgender individuals tend to engage with social media more frequently and are more prone to maintaining multiple accounts than their cisgender peers [9].

Social media refers to online platforms that enable users to endorse, comment send messages, or observe the activities of others, facilitating interaction among individuals [9]. Reasons for engaging with social media encompass entertainment, building relationships, seeking information, and the development and management of personal identity [10].

In literature, both positive and negative effects of social media on health outcomes amongst transgender people have been described. For example, some authors described an association between positive effects to well-being and social media including improved peer connections and the promotion of identity expression [11–17], while others described an association between heavy used social media and higher loneliness levels [18] and poorer mental health conditions [9,19], web-based victimization [20], and discrimination [11].

Social media addiction can be driven by intrinsic [21] as well as extrinsic factors according to the motivation theory [22]. In line with the attachment theory humans have an innate desire to belong to or be connected with others [6].

Thus far, little is known about the prevalence of probable social media addiction and factors associated with problematic social networking sites use exclusively among transgender individuals. More precisely, previous studies in this research field were somewhat restricted by the fact that they did not distinguish between LGBT people in the broader sense and transgender people in particular (i.e. transgender people were not analyzed separately) [23–26]. Also, previous studies usually only refer to children/adolescents [20,27, 28]. Consequently, our aim was as follows: to determine the frequency of probable social media addiction and to investigate the factors associated with problematic social networking sites use exclusively amongst transgender adults amid the pandemic.

In light of adverse poor mental health [29–31] and increased use of social media [8], we expect that transgender individuals may be more prone to social media addiction. We assume that social media is an important platform for transgender people to form and express their identity and to connect with peers. This could lead to increased engagement or addiction to social media. Moreover, since the data collection for our study took place during a period in which most corona-related restrictions were cancelled, we assume that the pandemic had a rather small impact on our study.

This understanding is crucial for gaining deeper insights into the usage of social media in this group and may assist in addressing transgender people at high risk of problematic social networking sites use.

2. Materials and methods

2.1. Sample

The "Transgender Survey" HH-TPCHIGV was created at the University Medical Center Hamburg-Eppendorf (UKE). Data were collected in 2022. This study's data was used.

The UKE is a large university hospital in Hamburg, Germany. It has currently more than 1700 beds and about 120 day care places. Specialists from all fields of medicine work in the UKE. Currently, the UKE has about 14,400 employees. Hamburg is located in the north of Germany and is the second-largest city in Germany (after Berlin). In total, the population of the urban area of Hamburg equals about 2.5 million.

In terms of inclusion: In this "Transgender Survey" HH-TPCHIGV (in sum, n equaled 104 observations) we included transgender people who had participated in self-help groups to obtain and exchange information regarding the gender-affirming surgeries conducted at the Division of Plastic, Reconstructive and Aesthetic Surgery at the UKE. Patients were recruited in particular through direct contact during consultation hours and during inpatient stays. In addition, the secretariat of the Division of Plastic, Reconstructive and Aesthetic Surgery also advertised by telephone. Furthermore, one author (KG) directly approached members of the groups to disseminate our study.

2.2. Dependent variable

The German version [32] of the Bergen Social Media Addiction Scale (BSMAS) [33] was used to assess probable social media addiction. This is a common and established tool to quantify probable social media addiction. More precisely, a recent study validated the BSMAS in younger and older individuals in nine countries (including Germany) [34]. This previous study also supported the unidimensional structure of the BSMAS in nine different countries [34]. Discriminant and convergent validity have been demonstrated [34]. They also showed an approximate normal distribution in all countries examined [34]. A high Cronbach's alpha of 0.90 is also present. The BSMAS consists of six items, each with a score ranging from 1 (very rarely) to 5 (very often).

First, a total score ranging from 6 to 30 was calculated, whereby higher values correspond to higher problematic social networking sites use. This total score served as outcome measure in regression analysis. Of note, we did not conduct a logistic regression (with probable social media addiction as outcome) due to the small sample size.

With regard to the prevalence: Former research has suggested a cut-off score of 19 for probable social media addiction.

Nevertheless, another study suggested a cut-off of 24 for probable social media addiction using the gold standard of clinical diagnosis [35]. We also reported the prevalence based on this more restrictive cut-off for the total sample.

2.3. Determinants

Informed by former studies [36,37], several determinants were selected. With regard to sociodemographic and lifestyle-related factors, we included these factors: age (in years), marital status (divorced; single; widowed; living together: married or in partnership; living separately: married or in partnership), and school education.

Additionally, we included employment status (different categories such as full-time employment or unemployment), having a migration background (absence or presence), having a religious affiliation (Non-denominational; Islam; Christianity; Buddhism; Other), having a gender reassignment surgery (yes or no), and the frequency of sports activities (from "no sports activity" to "more than 4 h a week"). Regarding health-related factors, we included self-rated health (from 1 = very bad to 5 = very good) and having one or more chronic conditions (no; yes) in regression analysis.

2.4. Statistical analysis

The prevalence of probable social media addiction among transgender people was calculated. We also calculated the prevalence for some key subgroups.

Moreover, we examined the determinants of problematic social networking sites use using multiple linear regressions. Thus, our outcome measure was used as continuous measure in order not to reduce the information content further. Robust standard errors were computed in multiple linear regression analysis. To address missing data [38], a full-information maximum likelihood (FIML) approach was used (using the "mlmv" option in Stata - when using the "sem" command). The FIML approach is an increasingly popular approach for dealing with missing data. It commonly performs well particularly when dealing with small samples. The Shapiro-Wilk test (p = 0.99) supports the idea that our outcome (problematic social networking sites use) is normally distributed.

In our current study, statistical significance was defined as $p < 0.05$. Moreover, marginal significance was assumed when p-values ranged from 0.05 to 0.10. Of note, with a $R^2 = 0.2$, a statistical power of 0.9 and a significance level of $\alpha = 0.05$, a sample size of n = 92 would be required for a significant overall model with ten predictors.

3. Results

3.1. Sample characteristics and proportion of satisfied transgender people

In our sample, the average age was 30.4 years (SD: 9.6 years; median: 28). In Table 1, sample characteristics are shown. In total, 46.2 % of the individuals were married or in partnership. Moreover, 42.9 % of the individuals had a general or subject-specific

Table 1
Sample characteristics.

Variables	Mean (SD)/n (%)
Age group	
18–29 years	53 (58.2 %)
30 years and older	38 (41.8 %)
Marital status	
Living separately: married or in partnership; divorced; single; widowed	49 (53.8 %)
Married or in partnership	42 (46.2 %)
Education	
Absence of general or subject-specific university entrance qualification	52 (57.1 %)
Presence of general or subject-specific university entrance qualification	39 (42.9 %)
Migration background	
No	80 (87.9 %)
Yes	11 (12.1 %)
Employment status	
Unemployed	16 (17.6 %)
Full-time employed	34 (37.4 %)
Other	41 (45.1 %)
Religious affiliation	
Non-denominational	53 (58.2 %)
Having a religious affiliation	38 (41.8 %)
Already having a gender reassignment surgery	
No	50 (56.8 %)
Yes	38 (43.2 %)
Self-rated health (from 1 = very bad to 5 = very good)	3.7 (0.9)
Chronic diseases	
Absence of at least one chronic disease	52 (51.0 %)
Presence of at least one chronic disease	50 (49.0 %)

university entrance qualification. Additionally, 12.1 % of the individuals had a migration background. Furthermore, 17.6 % of the individuals were currently unemployed and 41.8 % of the individuals had a religious affiliation. Moreover, 43.2 % of the individuals already had a gender reassignment surgery. More details are shown in Table 1.

Based on the cut-off of 19, the prevalence of individuals with probable social media addiction was 20.5 % (see Table 2). In contrast, based on the cut-off of 24, the prevalence of individuals with probable social media addiction was 3.4 %. The prevalence of probable social media addiction was also displayed for several subgroups. The prevalence varied from 13.2 % (among individuals without a religious affiliation) to 36.4 % (among individuals having a migration background). Please see Table 2 for further details. Of note that average social media addiction score (ranging from 0 to 30) was 16.2 (SD: 3.8; median: 16).

3.2. Regression analysis

In Table 3, findings of multiple linear regressions are shown. R^2 was 0.24. Multicollinearity was not a threat to the validity of our results since the highest variance inflation factor (VIF) was 2.52 (mean VIF was 1.60). Regressions showed that problematic social networking sites use was significantly positively associated with having a migration background ($\beta = 2.41$, $p = 0.03$), and a higher frequency of sports activities (e.g., regularly, more than 4 h a week compared to no sports activity: $\beta = 2.94$, $p = 0.01$). In contrast, problematic social networking sites use was not significantly with the other independent variables. Further details are shown in Table 3.

4. Discussion

The objective of our study was to determine the frequency of probable social media addiction and to investigate the correlates of problematic social networking sites use among transgender people. Our key findings: In sum, 20.5 % of the transgender people can be classified as probably addicted to social media (using the lower threshold). However, based on this threshold, this also means that 79.5 % cannot be classified as probably addicted to social media. Regressions showed that problematic social networking sites use was significantly positively associated with having a migration background, and a higher frequency of sports activities.

In our study, about a fifth of transgender people were addicted to social media. This finding is generally in line with earlier studies suggesting transgender people heavily using social media (e.g. Ref. [8]). A former study reported a prevalence of 7.0 % (cut-off of 19 of

Table 2
Prevalence of probable social media addiction among several groups.

	n	Probable social media addiction	p-value
Total sample	N = 88	20.5 %	
Age group			0.24
	N = 53	16.0 %	
18–29 years			
30 years and older	N = 38	26.3 %	
Marital status			0.25
	N = 49	25.0 %	
Living separately: married or in partnership; divorced; single; widowed			
Married or in partnership	N = 42	15.0 %	
Education			0.82
	N = 52	19.6 %	
Absence of general or subject-specific university entrance qualification			
Presence of general or subject-specific university entrance qualification	N = 39	21.6 %	
Migration background			0.16
	N = 80	18.2 %	
No			
Yes	N = 11	36.4 %	
Employment status			0.44
	N = 16	31.3 %	
Unemployed			
Full-time employed	N = 34	20.6 %	
Other	N = 41	15.8 %	
Religious affiliation			0.04
	N = 53	13.2 %	
Non-denominational			
Having a religious affiliation	N = 38	31.4 %	
Already having a gender reassignment surgery			0.98
	N = 50	20.8 %	
No			
Yes	N = 38	21.1 %	
Chronic diseases			0.11
	N = 52	13.6 %	
Absence of at least one chronic disease			
Presence of at least one chronic disease	N = 50	27.3 %	

Notes: Chi^2 tests were conducted (p-values). Individuals were classified as addicted to social media using a cut-off of 19 (BSMAS).

Table 3
Determinants of problematic social networking sites use. Findings of multiple linear regressions.

Independent variables	Problematic social networking sites use
Age (in years)	0.08
	(0.05)
Marital status: Living together: Married or in partnership (Reference category: Other [including living separately: married or in partnership; divorced; single; widowed])	−1.25
	(0.76)
School education: General or subject-specific university entrance qualification (e.g. "Abitur") (Reference: Lower school education [including Completion of polytechnic secondary school; Currently in school education; Secondary school diploma; Intermediate school leaving certificate (e.g. "Realschulabschluss"); Without general school leaving certificate])	0.06
	(0.81)
Employment status: Full-time employed (Reference category: Unemployed)	−0.45
	(0.93)
- Other [including Part-time employed; Marginally employed (450-euro job or mini-job); Retired/early retirement; Other; In retraining; In vocational training/apprenticeship]	−0.98
	(0.98)
Migration background: Yes (Reference category: No)	2.41*
	(1.11)
Religious affiliation: Having a religious affiliation [including Buddhism; Christianity; Islam; Other] (Reference category: Non-denominational)	0.18
	(0.80)
Already having a gender reassignment surgery: Yes (Reference category: No)	−0.23
	(0.78)
Frequency of sports activities: Less than 1 h a week (Reference category: No sports activity)	3.10*
	(1.26)
- Regularly, 1–2 h a week	1.61
	(0.99)
- Regularly, 3–4 h a week	2.79*
	(1.27)
- Regularly, more than 4 h a week	2.94*
	(1.17)
Self-rated health (from 1 = very bad to 5 = very good)	−0.62
	(0.50)
Having at least one chronic condition: Yes (Reference category: No)	−0.53
	(1.03)
Constant	15.02***
	(2.52)
R^2	0.24
Observations	104

Notes: Unstandardized beta-coefficients are displayed; robust standard errors in parentheses; ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$, + $p < 0.10$; To address missing data, a full-information maximum likelihood (FIML) approach was used.

the BSMAS) in the general adult population in Germany [36]. When a cut-off of 24 was used, the prevalence was 2.0 %. They examined the general adult population aged 18–74 years in Germany. Data collection was in mid-March 2022. Our current study showed markedly higher prevalence rates among transgender individuals when the less strict threshold was used. However, the difference was reduced if the stricter threshold was used.

Social identity theory [39] may explain the quite high prevalence rates identified in our study. This theory indicates that some part of an individual's identity is shaped by their social groups. In order to form and express their identity, social media can be a relevant space, finding acceptance as well as connect with others with similar experiences among transgender individuals [40]. We suspect that social media can be identity-forming not only for children and adolescents, but also for adult [41]. Strengthening identity through online communities can lead to increased social media engagement – or even addiction to social media.

Interestingly, our data showed that the heavily use of social media platforms was significantly associated with increased sportive activities. Given the rapid increase in social media usage in recent years [42], nutrition and health professionals are striving to harness these platforms to promote healthy food choices and nutrition-related behaviors among social media users [43]. Social comparisons may also be of relevance here [42].

Interestingly, our data showed that transgender people having a migration background significantly more often used social networking sites. It can be speculated that some gender uncertainties are higher for individuals with a migration background due to unfamiliarity with the health care system in Germany as well as cultural differences and language barriers. Another explanation may be that social networking sites were used more frequently by individuals with a migration background due to communication with others (e.g., with relatives from the country of origin).

Our study was performed during later stages of the pandemic. In literature, authors suggest that in general people try to cope with the changed world during the pandemic by using social media to interact with others [44]. This observation might also slightly influence the results of our analysis. In general, social media usage has been shown to significantly increase during crises [45]. During the COVID-19 pandemic media channels became one of the most important source of information about SARS-CoV-2 infection [46]. Another relevant aspect was the fact that clinicians use these social media platforms to influence the peoples' behaviour (for example hand washing and disinfection) during the COVID-19 crisis [47]. For example, clinicians try to influence the awareness of the symptoms and the function of the virus to educate the people about for example the development of the vaccines, the duration of the illness or the clinical course of disease [47].

We would like to highlight some strengths and weaknesses. Our study exclusively focused on transgender persons. This is generally a quite hard to reach group of individuals which is mostly neglected in current research. Often, unlike our current study, comparable studies subsumed transgender people under the LGBT group and cannot make any robust statements exclusively about transgender people. However, a comparison group (i.e., cisgender individuals) is missing. Moreover, we used a FIML approach to handle missing data. It should be noted that a valid screening tool (German version of the BSMAS) was used to quantify probable social media addiction. Notable shortcomings are the cross-sectional design of our study and the unclear generalizability of this rather small, hospital-based sample. Furthermore, it should be noted that the focus on transgender people who had joined self-help groups may have introduced selection bias. Other possible limitations refer to self-reporting and a potential social desirability bias. Moreover, additional data on the characteristics of individuals with a migration background should be explored in upcoming studies.

5. Conclusion and future research in this area

While previous studies have mostly focussed on the rather heterogeneous group of LGBT people (and therefore not explicitly on transgender people) and often on children or adolescents, this current study extends our knowledge by focusing on social media addiction exclusively among transgender people in adulthood. Our study stressed the challenge of probable social media addiction among transgender people. About one in five can be classified as probably addicted to social media. Regressions showed that problematic social networking sites use was positively associated with having migration background and a higher frequency of sports activities. Knowledge about the correlates of problematic social networking sites use may assist in addressing individuals at risk.

Future research in this neglected area is urgently needed. For example, longitudinal studies are needed to confirm our current results. Moreover, upcoming studies could focus on mediating (e.g., general self-esteem) and moderating factors (e.g., age group) of the determinants examined amongst transgender people. Furthermore, research based on large, representative samples would be of interest to obtain generalizable results. Additionally, research from other countries and continents would be very desirable. It is likely that factors such as stigma against transgender individuals can vary markedly between countries and regions. Moreover, it should be noted that there may be differences between regions or states in Germany (e.g., also in terms of perceived discrimination or stigma regarding transgender people). Therefore, differences between rural and urban regions in Germany should be examined in future studies. Additionally, age-stratified results would be desirable in future research. Furthermore, future studies should pay particular attention to the needs and functions in relation to their use of social media. Lastly, mixed-methods studies are recommended to gain a better understanding of the associations identified in this study.

Efforts to reduce social media addiction could prove beneficial. This could include education and awareness workshops to enhance responsible usage. Moreover, supporting offline activities can foster in-person social interactions. Furthermore, tailored psychological counselling may be beneficial to address emotional challenges related to excessive use of social media. Additionally, initiatives for digital detoxing may encourage breaks from social media. Role models within the community of transgender people may also inspire a more responsible use of social media.

With regard to the identified risk factors: Strategies to combat dissatisfaction with the body (in the case of transgender people with increased physical activity) may also be useful. Role models, which are particularly well known among transgender people with a migration background, could also be useful. However, further research is urgently needed.

CRediT authorship contribution statement

Katharina Grupp: Writing – original draft, Methodology, Conceptualization. **Marco Blessmann:** Writing – review & editing, Conceptualization. **Hans-Helmut König:** Writing – review & editing, Conceptualization. **André Hajek:** Writing – original draft, Supervision, Methodology, Formal analysis, Conceptualization.

Consent to participate

Consent was provided prior to participation by all individuals.

Ethics approval statement

Our study received approval from the Local Psychological Ethics Committee at the Center for Psychosocial Medicine at the University Medical Center Hamburg-Eppendorf (approval number: LPEK-0480). All experiments adhered to the pertinent guidelines and regulations outlined in the Declaration of Helsinki.

Data availability

The datasets analyzed during the current study are not publicly available due to ethical restrictions involving patient data but are available from the corresponding author on reasonable request.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to

influence the work reported in this paper.

Acknowledgement

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