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Young Users' Social Media Addiction: Causes, Consequences, and Preventions

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Young Users' Social Media Addiction: Causes, Consequences, and Preventions

Abstract

Purpose: Social media addiction has been an ongoing topic of debate for platform developers, wellbeing and mental health experts. There is a limited understanding of the factors leading to the addiction of young social media users, the consequences of experiencing addiction, and the measures/mechanisms used by parents and platform providers to limit/prevent problematic social media use among young users. We conducted a systematic review to provide a comprehensive overview of the literature concerning these issues. **Methodology:** The Preferred Reporting Items for Systematic Reviews (PRISMA) protocol was used to evaluate and present the results. A total of 45 studies were screened and independently reviewed against predetermined criteria for eligibility. **Findings:** The results revealed four categories of young users' addiction to social media networks (social, technological, behavioural, and mental). Several prevention approaches directed at parents and platform providers were discussed. **Originality:** This study offers important insights for health policy makers, platform providers, parents, and researchers on designing interventions addressing social media addiction among young users. It also provides an in-depth understanding of the conceptualization of social media addiction and suggestions on possible actions to prevent it.

Keywords: social media networks; addiction; social media addiction; young users

1. Introduction

Social media networks among young users, "digital naives", are increasing by the day (Al Qudah et al., 2020). Factors like mobility, affordability and ubiquitous Internet connection make it easier for underage users to gain unrestricted access to social media networks. Every-time-everywhere computing has opened an avenue for intensive online socialization (Braumüller, 2020a). Internet-connected mobile devices are believed to have changed the way people use online spaces, hence creating new

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10 problems for parental control of children's Internet use (Hruska & Maresova, 2020).
11 Nowadays, young users get so attached to their mobile devices performing everyday
12 tasks that they often get carried away spending excessive hours online (Aparicio, 2020;
13 35 Sim, 2019), and even when they are asleep, their mobile devices are placed at an arm's
14 reach. The naïve nature of young users fused with the rewarding experience of online
15 social gaining is a crucial issue that requires investigation (Braumüller, 2020b).
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17 According to Beatty and Pauling (2021), social gain is identified as the process of
18 adding value, with individuals able to point to areas in which they have been upskilled.
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21 40 From a theoretical perspective, young users' addiction to social media sites can be
22 linked to the social cognitive theory of Bandura (2001). This theory attempts to explain
23 the relationship between beliefs and behaviour as a reciprocal learning process in which
24 people select, react to and learn from experiences. It emphasizes how people can
25 effectively learn through self-monitoring and self-guidance via personal standards and
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27 45 corrective self-reactions.
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30 Furthermore, the impact of the problematic use of social media sites on users has
31 been further justified by Caplan (2002). Caplan proposed the theory of problematic
32 internet use and psychosocial wellbeing, explaining that individuals who exhibit signs
33 of poor psychosocial health have a problematic relationship with the unique
34 50 communicative context available in cyberspace. In addition, Davis (2001) introduced a
35 theoretical model, named the cognitive-behavioural model of generalized problematic
36 Internet use, to explain the association between problematic Internet use and several
37 psychological wellbeing variables, including self-esteem, loneliness, depression, and
38 shyness. Supported by these theories, there have been publications about the excessive
39 use of social media networks and its effects on the wellbeing of people in general (Bano
40 et al., 2019; Rasmussen et al., 2020; Vannucci & Ohannessian, 2019). Empirical
41 evidence revealed the relationship between excessive use of social media networks and
42 health issues like addiction, depression, gambling, obesity, and anxiety among adults
43 55 and teenagers. Several previous studies (e.g., Demirtepe-Saygili, 2020; Dhir et al.,
44 2019; Pluhar et al., 2019) have discussed different strategies which parents could adopt
45 to control the problematic use of social media; other publications discussed intervention
46 through technological means (mobile applications). However, most of the research on
47 social media focused on privacy issues and academic performance (Choi et al., 2018;
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10 Oh et al., 2016). Our literature search revealed a limited number of publications on
11 65 social media addiction among young/adolescents, most especially the factors causing
12 the addiction. Most previous reviews (e.g., D'Arienzo et al., 2019; Duradoni et al.,
13 2020; Sun & Zhang, 2020) have focused on specific aspects related to the formation of
14 social media addiction scales, or general addiction in a population, and theories or
15 models that have been applied in studies of social media addiction. Yet, it appears that
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18 70 these reviews have a limited focus and narrow perspective. They do not cover up-to-
19 date facets of social media addiction among young users. For example, Sun and Zhang
20 (2020) presents a critical appraisal of developments in the field of addiction by
21 identifying certain theoretical perspectives and constructs only, while Guedes et al.
22 (2016) focus only on Facebook as the main means for people's addiction. In addition,
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25 75 much of the previous studies are empirical and do not focus adequately on how certain
26 factors may trigger addictive behaviour and other associated consequences among
27 young users. Meanwhile, information on the role of parents, social media providers,
28 and methods of controlling access and preventing social media addiction in young users
29 is deficient. In order to address the current shortcomings in the literature on social media
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32 80 addiction among young users, this study intends to answer three key questions: "What
33 are the main factors leading to addiction among young users in social media?", "What
34 are the consequences of experiencing addiction among young users?" and "What
35 are the measures/mechanisms used by parents and platform providers to limit/prevent
36 young users from experiencing social media addictions?" Outcomes from this study can
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39 85 help researchers, health communities, and social media platforms better understand the
40 variations in response to specific social media sites.
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44 2. Literature review

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47 90 Although the literature defined Internet addiction as the excessive use of the Internet
48 that brings about negative consequences (Błachnio et al., 2019), Demirtepe-Saygili
49 (2020) defined social media addiction as "a subtype of internet addiction, including the
50 behaviour of checking and updating". This could be related to obsessive behaviour that
51 may turn into a habit and eventually affect the wellbeing and overall quality of life
52 (Savci & Aysan, 2017). As such, addiction in the context of this study can be defined
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10 95 as the excessive preoccupation with social media (e.g., Instagram, Facebook, Snapchat,
11 and Twitter) that brings negative impacts for young users. This includes young users'
12 constant checking of their social media accounts for updates, likes, comments, and
13 friend requests.
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15 Bano et al. (2019) revealed the benefits of social bonding and social capital to the
16 wellbeing of young users through social media. Other previous studies (e.g., Baccarella
17 100 et al., 2018; Chang et al., 2019; O'Reilly et al., 2018) have addressed the adverse effects
18 of social media on adolescents and young people. This includes teenagers and young
19 adults who are generally naïve in nature, having limited experience with the real world
20 (Chou et al., 2019). Brailovskaia et al. (2020) categorized young people as the age
21 group vulnerable to narcissistic behaviour. The authors revealed the connection
22 between narcissism and Facebook addiction, resulting in health-threatening behaviours
23 like anxiety. They also revealed the affordable social media sites provide for the young
24 105 users, creating a virtual space where they can shape a virtual identity to promote their
25 self-esteem and satisfaction. In addition to anxiety, other symptoms related to users'
26 use of social media were cited by many researchers. These include; flow and salient
27 (Primack et al., 2017), depression (Brailovskaia et al., 2020; O'Keeffe & Clarke-
28 Pearson, 2011; Primack et al., 2017), tolerance and tension (D'Souza, 2019b; Shane-
29 Simpson et al., 2018), low self-esteem (Atroszko et al., 2018; Hawi & Samaha, 2017;
30 Volkmer & Lerner, 2019), and relapse (Swar & Hameed, 2017).
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32 Moreover, other previous studies have focussed on security and privacy issues
33 related to young social media users. For example, some previous studies (e.g., Choi &
34 Sung, 2018; Chou et al., 2019) expressed concern about the population of underage
35 users on social media regarding their low knowledge about self-regulation towards
36 disclosing and sharing personal information on social media. Young users get attention
37 and support from their virtual followers through platform functions like 'comments and
38 120 likes'. However, this would raise their self-esteem and satisfaction and could negatively
39 trigger tension, depression, or anxiety when they come across negative feedback.
40 Gabriel (2014) and Ingram et al. (2019) brought to light the attitude of "sexting" and
41 "selfies" among young people through social media, primarily through the use of
42 mobile technology. Addictive simulated games of gambling among underage social
43 125 media users, which could result in obsessive and addictive behaviours, have also been
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10 addressed in the literature (Hawi et al., 2018; King et al., 2014). In addition, daily time
11 spent on social media applications has been attributed to increasing social media
12 addiction among users (Chung et al., 2019; Hou et al., 2019).

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14 130 Based on these observations, it can be said that social media addiction requires
15 continuous research. Although there are many publications regarding the topic, the
16 information is so comprehensive that it requires the information to be sorted out and
17 organized more straightforwardly. In addition, the picture that emerged from these
18 studies seems to lack an understanding of how specific social media platforms may
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20 135 cause or results in young users' addiction. Thus, this paper intends to review studies on
21 various factors that lead to social media addiction. It also categorizes these factors
22 according to groups and provides preventive measures that can be deployed to mitigate
23 or avoid social media addiction amongst young users.
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28 140 **3. Method**

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30 For this review, the Preferred Reporting Items for Systematic Reviews (PRISMA)
31 protocol by Moher et al. (2009) was adopted for guidance and quality purposes. The
32 PRISMA protocol provides a sequential process to help search, collect, analyse and
33 structure the review paper. We used this protocol because it reduces the bias and
34 improves the quality (Moher et al., 2009). Young individuals in this study refer to social
35 145 media users aged over 13 and below 24 years old (Ferreira, 2012; Lian et al., 2014;
36 Mbuthia et al., 2018; Reborá et al., 2019). It is also worth mentioning that some of the
37 studies we reviewed included a more comprehensive range of users age 11-25.
38 However, the conclusions provided in these studies were consistent across all age
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40 150 groups. Thus, this study included previous works that involved young participants of
41 mixed ages (11-25 years) in conducting this review.
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47 **3.1 Literature search and inclusion criteria**

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49 This study reviewed previous empirical work on social media addiction among
50 155 young users in different contexts and settings. The included studies in this review were
51 published in peer-reviewed journals, conference proceedings (including book chapters),
52 and online theses. Here we used certain query filters in order to retrieve relevant articles
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10 from different databases. A literature search was performed using Science Direct,
11 Elsevier, Taylor and Francis Group, SAGE, Google Scholar, Springer, Sage Journals,
12 160 ACM Digital Library to retrieve various studies used in this review. The following
13 keywords were used: (“Social media sites” OR “Social media networks” OR “social
14 media spaces” OR “Facebook” OR “Twitter” OR “Instagram” OR “Snapchat” OR
15 “Pinterest” OR “Reddit”) AND (“Underage” OR “Youth” OR “Young” OR
16 “Students”) AND (“Addiction” OR “Excessive use” OR “Time spent”) were used in
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18 165 identifying prominent publications for this review. Our search of the previous studies
19 was not limited to language, data, or journal ranking. Boolean operators and quotation
20 marks were used to retrieve variations in the lexicon and identify the desired
21 intersection during the search of the previous studies.
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25 We searched the literature from January 2015 to August 2020 for articles addressing
26 170 various aspects of social media addiction and use among young individuals in different
27 contexts and settings. The search start date of January 2015 was chosen to account for
28 the increasing incidence of addiction across social media platforms such as Instagram,
29 Facebook, and YouTube. In addition, there are limited review studies in the literature
30 on social media addiction after 2015.
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3.2 Articles screening and coding

35 Using the above data, we retrieved 714 studies with an additional 240 studies
36 identified through other sources such as reference lists. Two of the researchers screened
37 both titles and abstracts of the initial search results (n: 954) from multiple databases.
38 180 Since we used multiple databases, a total of 278 duplicates from these collections were
39 identified and removed. Besides duplicates, we also removed 29 studies that did not
40 truly reflect social media addiction (based on abstract screening). After all, 647 articles
41 were identified and examined against the following inclusion criteria: “Relevance of
42 the objectives in terms of answering this study’s questions (140 articles were
43 removed)”, “Articles published in the English language between 2015 and 2020 (211
44 articles were removed)”, “The sample consisted of individuals between ages 10 and 24
45 years (74 articles were removed)”, and “Empirical studies that applied
46 qualitative/quantitative methods (116 articles were removed).” Based on these criteria,
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10 a total of 541 articles were removed, leaving us with 106 articles. We further removed
11 190 61 articles for additional reasons: “articles with a theoretical focus”, “articles which
12 talk about general Internet addiction”, and “articles that involved a mix of adults and
13 young users.” The remaining 45 articles were thoroughly reviewed to identify factors
14 and causes of social media addiction among young users. These articles were carefully
15 examined by two reviewers (authors). A meeting was set up to compare notes and agree
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18 195 on critical factors/causes of social media addiction. Four main dimensions were
19 identified and used in this study: behavioural, technological, social, and mental.
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21 The main factors and causes of social media addiction in previous studies were
22 coded by assessing whether these studies included items assessing one or more
23 dimensions. An item-focused coding approach was used in this study to ensure
24
25 200 heterogeneity across platforms and settings. The social media addiction factors/causes
26 were placed under the behavioural dimension if they were related to the way users use
27 social media and are based on a user’s beliefs, attitudes and intentions. The social media
28 addiction factors/causes were placed under the technological dimension related to
29 information system and connectivity software. The factors/causes related to certain
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32 205 traditional beliefs within a community were placed under the social dimension. In
33 addition, health-related factors/causes that represent a broad range of activities related
34 to the mental wellbeing component directly or indirectly were grouped under the mental
35 dimension.
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210 3.3 Quality assessment

41 A total of 45 articles were identified and used for the review. Three experts (two
42 lecturers and one researcher in behavioural addiction) were independently assigned to
43 evaluate the selected papers. We used four criteria to help experts make efficient
44 decisions about the quality of the 45 articles:
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47 215 1- Relevance of the study focus on addressing young users’ addiction to social
48 media sites.
49 2- Appropriateness of the social media platform (e.g., Facebook, Twitter,
50 Instagram, Snap Chat, YouTube, etc.).
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- 220 3- Appropriateness of the study type and relevance to this review (quantitative, qualitative, and mixed design).
- 4- Reliability of the results and their implication in answering this study's questions.

225 A literature matrix was constructed to enable experts to review all the collected articles that examined fundamental factors/causes of social media addiction among young users. A spreadsheet (consisting of crucial information about the article, such as authors and year, title, aim, method, platform, factors, and sample), was used by the three experts to add their recommendations on whether the article was relevant to this study, and a consensus meeting was called to exchange their observations. Here we used the standard interrater reliability criteria to assess and obtain the quality of indicators. The interrater reliability was measured in this study by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. The average value for the interrater agreement was 89% among the experts. The total number of studies included in this review based on the inclusion and quality check was 45, as shown in Figure 1.

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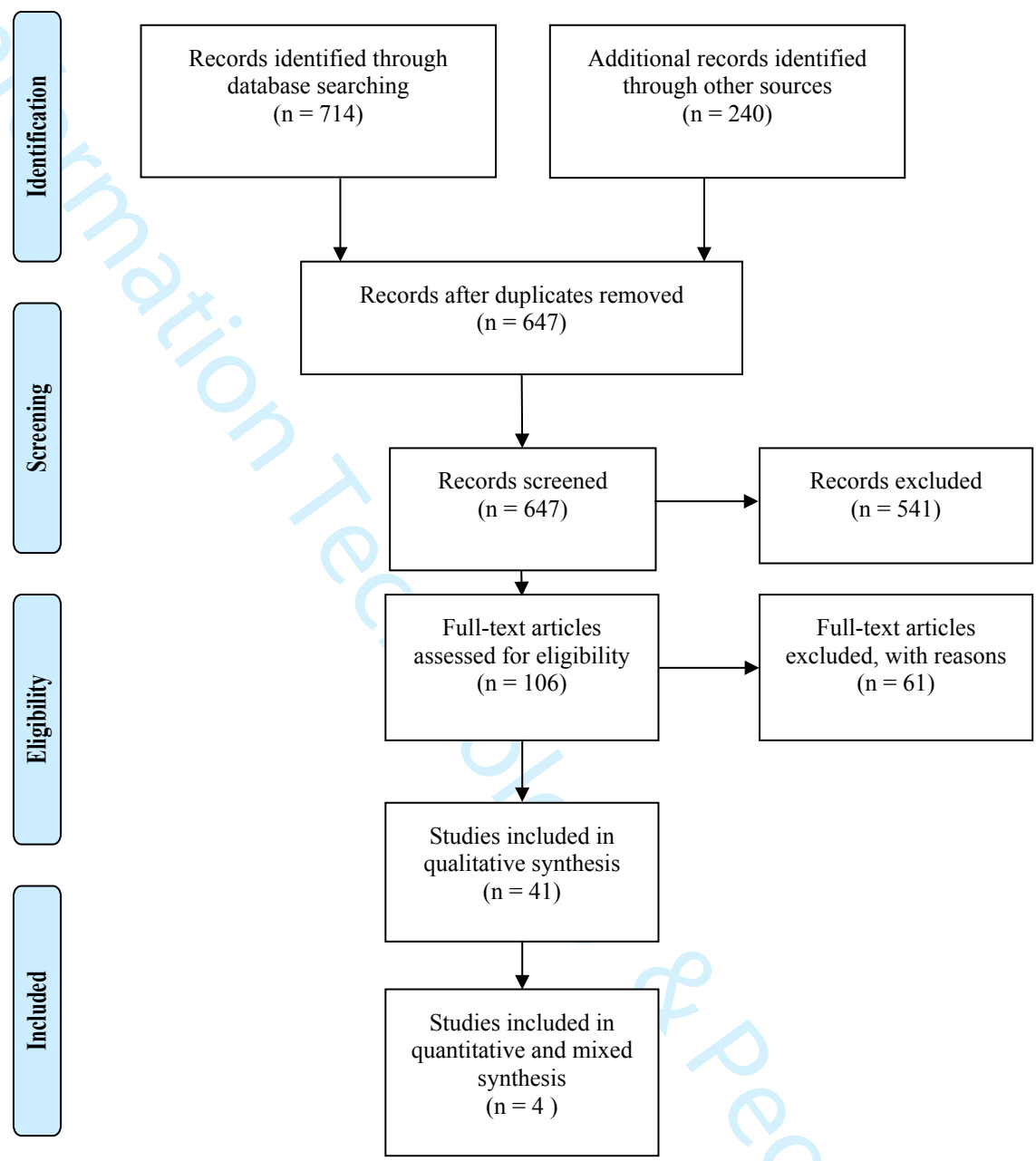


Figure 1: Study selection flowchart

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4. Results

This section intends to answer the main research questions proposed earlier. Table 1 shows the list of studies in this review concerning the identified factors on social media addiction. The literature review revealed various factors that are believed to be the leading causes of addiction among young social media users. These factors were then categorized into four main groups/dimensions: behavioural, technological, social factors, and mental.

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251 Table 1. Summary of reviewed studies

No.	Study	Purpose	Factor	Outcomes	Method	Age	Social media network
1	Hawi and Samaha (2017)	Examined the relationship between addictive use of social media, users' self-esteem, and satisfaction.	Self-esteem and satisfaction with life	Social media addiction was related to low self-esteem.	Quantitative	16-18	Facebook
2	Padilla-Walker et al. (2018)	Explored how different media monitoring styles are used by parents to control media usage by their children.	Active and passive co-use	Active monitoring and co-use combined with low-level restrictions proved to reduce total media time.	Quantitative	13-15	SNS
3	Akakandelwa and Walubita (2018)	Examined the purposes for which students use social media.	Time spent	Students used social media more for social information than for academic purposes.	Quantitative	17-24	WhatsApp and Facebook
4	Punyanunt-Carter et al. (2017)	Studied communication behaviours of students' Snapchat use.	Communication apprehension	As needs are met, users' addiction to Snapchat increases.	Quantitative	18-24	Snapchat
5	Choi and Sung (2018)	Examined if privacy concerns can be linked to user's selection of SNS and their personality types.	Online privacy and image-based SNS	Expression of the true self was related to the use of Snapchat among social media users. Users with ideal self- and high self-privacy were linked to the use of Instagram.	Quantitative	17	Instagram and Snapchat
6	Brailovskaia and Teichert (2020)	Studied the development of addictive tendencies among young users.	Implicit associations	Social media flow-mediated the relationship between the implicit associations and addictive use of social media.	Quantitative	21	Facebook, Instagram and Twitter
7	Chou et al. (2019)	Explored the privacy behaviour profiles of underage Facebook users.	Ineligible users, parental mediation, and adolescents' privacy practices	Instructive mediation was found to be effective in reducing online disclosure in underage SNS users.	Quantitative	9-17	Facebook

8	Hamutoglu et al. (2020)	Studied the effect of social media addiction on fear of missing out.	Fear of missing out	Fear of missing out was found to predict the social media addiction of users.	Quantitative	18-25	WhatsApp, Facebook, Instagram, Twitter, and YouTube
9	Afe et al. (2020)	Investigated Smartphone addiction and the relationship to the frequency of social media use and psychological morbidity.	Frequency of social media use and psychological morbidity	Smartphone addiction was more frequently associated with psychological morbidity.	Quantitative	17-21	WhatsApp, Facebook, Instagram, Twitter, YouTube, and Snapchat
10	Al Saud et al. (2019)	Explored perceived body image and social media addiction among students.	Body image	There was an association between social media addiction and the body mass index of users.	Quantitative	18-24	SNS
11	Akin (2017)	Investigated how internet addiction levels lead to differences in social media addiction.	Communication and sharing	Young people use social media primarily to establish communication and to make various kinds of sharing.	Quantitative	18	Facebook
12	Shane-Simpson et al. (2018)	Investigated individual preferences in selecting SNS.	Site affordance, privacy and self-expression, and social capital	Twitter users were more likely to have public profiles, followed by Facebook and Instagram.	Quantitative	18-25	Facebook, Instagram, and Twitter
13	Primack et al. (2017)	Examined the relationship between the use of multiple social media platforms and health problems.	Depression, anxiety, multiple uses of social media sites, time spent on social media	Increased time on social media was associated with depression and anxiety.	Quantitative	19	Facebook and Twitter
14	Fang et al. (2020)	Investigated how missing out and problematic social media use mediate emotional support and phubbing behaviour.	Emotional support and fear of missing out	The results indicated that emotional support from social media was positively associated with phubbing behaviour.	Quantitative	17-23	SNS

15	Atroszko et al. (2018)	Investigated Facebook addiction, causes, relation to user's personality and wellbeing	Facebook addiction and social anxiety	Facebook addiction was related to higher extraversion, narcissism, loneliness, social anxiety, and lower general self-efficacy.	Quantitative	20	Facebook
16	Baltaci (2019)	Examined how users' social anxiety, happiness and loneliness levels can predict their levels of social media addiction.	Social anxiety, happiness and loneliness levels	A significant relationship between students' social media addiction levels and social anxiety and loneliness levels was found.	Quantitative	19 - 25	SNS
17	Nelissen and Van den Bulck (2018)	Investigated how children influence their parents to use digital media.	Child-Parent media use and guidance	Families with high child-parent media guidance reported more conflict in media usage.	Quantitative	12-19	N/A
18	Topalli (2016)	Explored the perception of children, parents, and teachers on the use of new media.	Perception of social media effects and frequency of use	Users constantly used social media either for schooling or socializing purposes. Instagram, Snap Chat and Facebook were the most used.	Qualitative	12-15	Instagram, Facebook, and Snapchat
19	O'Reilly et al. (2018)	Explored the perception of young users towards social media.	Mental health	Negative perceptions were reported on the impact of social media use on users' mental health.	Qualitative	11-18	Facebook, Twitter, and Tumblr
20	Throuvala et al. (2019)	Explored adolescents' key motivation to social networking sites use and values.	Instagram (Fake Instagram account), and use of inner-circle platforms	Adolescents' use of social media was due to symbiotic relationship with peers and functionality-facilitation of communication functions.	Qualitative	12-16	Facebook, Twitter, Instagram, Snapchat, and YouTube
21	Gong, Zhang, Cheung, et al. (2019)	Examined the role of desire for online group gaming in online social gaming addiction.	Online game use, online group gaming, and self-regulation	Attitude, anticipated enjoyment, group norm, and social identity contributed to the desire for online group gaming.	Quantitative	22	Honour of Kings, WeChat, QQ, and Facebook
22	Pittman and Reich (2016)	Explored the impact of extended intimacy picture based and text-based social media sites with loneliness.	Extended intimacy, loneliness, social presence	The use of picture-based SNS was found to reduce loneliness while increasing happiness and satisfaction with life. Text-based SNS showed no effect.	Mixed	22	Instagram, Snapchat, Twitter, YikYak, and Facebook

23	Chou et al. (2019)	Studied the privacy behaviour of underage users in social media.	Underage use of social media and parental mediation	Underage students have active Facebook accounts even though they are ineligible.	Quantitative	9-17	Facebook
24	Tang and Patrick (2018)	Examined age, gender and race/ethnicity regarding the use of social media among young users.	Use of interactive social media, homework, and school grade	8 th graders spend more time playing video games, watching TV than 10 th graders.	Quantitative	9-16	Facebook, Twitter, and Instagram
25	Taylor (2020)	Examined the impact of social media on academic performance and whether the interpersonal communication levels of students suffer.	Interpersonal skills and wellbeing	The impact of social media use has depended upon the students, their ability to focus, and their knowledge of how to use social media for academic purposes.	Quantitative	13-24-year-old	Twitter, Snapchat, and Instagram
26	Köse and Doğan (2019)	Identified the psychological dimensions of social media addiction in young users.	Self-esteem levels	A moderate, negative correlation was found between self-esteem levels and social media addiction.	Quantitative	Young users	Instagram
27	Grau et al. (2019)	Examined social media addiction among student millennials.	Self-control	Social media users were able to exhibit self-control regarding their social media usage.	Mixed	19 and 22	Facebook, Twitter, Instagram, and Blogging
28	Tunc-Aksan and Akbay (2019)	Investigated the potential of smartphone addiction, fear of missing out, and perceived social and academic competence in predicting social media addiction.	Smartphone addiction, fear of missing out, and perceived competence	Smartphone addiction, fear of missing out, and perceived academic competence predict social media addiction in high school students.	Quantitative	High school students	n/a
29	Simsek et al. (2019)	Investigated differences in users' social media addiction from a demographic perspective.	Gender, school type, and duration of daily use	High school students who spent long periods on social media had a moderate level of addiction.	Quantitative	High school students	Facebook
30	Casale and Fioravanti (2018)	Proposed a model that explains how grandiose and vulnerable narcissists might develop Facebook addiction.	Grandiose narcissism and vulnerable narcissism	Grandiose narcissism and social media addiction levels were mediated by the need for admiration and the need to belong.	Quantitative	22	Facebook

31	Ponnusamy et al. (2020)	Investigated the influence of students' needs on Instagram addiction by considering the moderating role of psychological wellbeing.	Recognition needs, information needs, social needs, and entertainment needs	Recognition and social needs had a significant influence on Instagram addiction.	Quantitative	19	Instagram
32	Yang (2016)	Explored associations between loneliness and various Instagram activities.	Loneliness	Social media interaction and browsing were related to lower loneliness, whereas social media broadcasting was associated with higher loneliness.	Quantitative	19	Instagram
33	Jeri-Yabar et al. (2019)	Investigated the association between social media dependence and depressive symptoms and also characterized the level of dependence.	Depressive symptoms	An association between social media dependence and depressive symptoms was found.	Quantitative	20	Instagram, Twitter, and Facebook
34	Kircaburun and Griffiths (2018)	Examined the relationships between personality, self-liking, daily Internet use, and Instagram addiction.	Personality and self-liking	Agreeableness, conscientiousness, and self-liking were negatively associated with Instagram addiction.	Quantitative	18-25	Instagram
35	Masthi et al. (2015)	Examined the burden of Facebook addiction among college students of health university.	Desire to engage and use technology	The feeling of anxiety was observed among users when they did not have access to Facebook.	Quantitative	18-25	Facebook
36	Huang and Su (2018)	Investigated motives for Instagram use and topics of interest among young adults.	Social interaction and diversion motives	The motives for social media use mainly were to look at posts, particularly involving social interaction and diversion motives.	Quantitative	12 and 24	Instagram
37	Sanz-Blas et al. (2019)	Examined the impact of excessive use of Instagram on users' emotions.	Technology overuse	Addiction partially mediated the impact of overuse on emotional fatigue and interstress.	Quantitative	18	Instagram

38	Isada and Isada (2019)	Examined the relationship between Instagram addiction among university students in Japan and the psychology of internet behaviour.	Posting expression and a sense of belonging	Social media addiction was correlated to the emotional reaction to the internet, consideration for posting expression and a sense of belonging.	Quantitative	Young	Instagram
39	D'Souza (2019a)	Compared the extent of Instagram addiction among students pursuing medical and dental courses.	Self-control, health and interpersonal troubles	Lack of control, health and interpersonal troubles were found among students.	Quantitative	17-25	Instagram
40	Yesilyurt and Turhan (2020)	Examined the variables that predict the time spent on Instagram by university students.	Time spent	The time spent on Instagram, gender, age was correlated with social media addiction.	Quantitative	18-22	Instagram
41	Balcerowska et al. (2020)	Investigated the mediating roles of cyber victimization and social media addiction on Instagram popularity.	Followers count	Adolescents' followers count showed an increase in social media addiction and exposure to cyber victimization.	Quantitative	13	Instagram
42	Masters (2015)	Measured SNS addiction rates among health sciences students in Oman.	Work-related activity	Addiction rates decreased when work-related activity was taken into account.	Quantitative	20-25	Facebook, YouTube, and Twitter
43	Gul et al. (2018)	Investigated the effect of ADHD, impulsivity types on Facebook overuse and addiction.	Overuse	Users who have more fake social media accounts are likely to be more addicted.	Quantitative	13-19	Facebook
44	Saied et al. (2016)	Investigated Internet and Facebook addiction among university students.	Internet access and overuse of mobile	Excessive Facebook and internet use are associated with adverse health effects and unhealthy behaviours.	Quantitative	22	Facebook
45	Alzougool and Wishah (2019)	Examined the use and addiction of social media by university students in Jordan.	Time spent	The more time students spend using SNAs, the more likely they will exhibit symptoms of SNAs addiction.	Quantitative	18-24	WhatsApp, Facebook, YouTube, Instagram, Snapchat, and Google Plus

4.1 Social media addiction among young users: causes and consequences

4.1.1 Behavioural

Behavioural factors in this context refer to an individual's activity, attitude, and approach to social media use. Such activities involve routine daily tasks, like using mobile devices and computers to connect with family and friends. However, just like many other forms of addiction, excessive engagement with technology to get the desired outcome over time could turn into habit and dependency on that technology, and social media is not an exemption. The excessive use of social media is believed to negatively affect general wellbeing and quality of life, especially in young users (Alzougool & Wishah, 2019; Taylor, 2020). According to Swar and Hameed (2017), young students engaged in social media networking while studying tend to achieve lower grades than those who do not engage with social media. Primack et al. (2017) explained that social media users who spend excessive time online are prone to develop signs of anxiety, depression, and addiction to social media. Furthermore, Lenhart et al. (2010) argue that teens between the ages 12-17 have the highest number of online presence in addition to the enthusiasm to use the social network for a very long time. For this reason, one can argue that young users between the ages of 10 and 25 are more vulnerable to become addicted to social media due to oversharing and time spent on the platform than any other age group, as supported by the work of Akakandelwa and Walubita (2018) and Alzougool and Wishah (2019).

Aspects related to young individuals' attitude, anticipated enjoyment, group norm, and social identity may contribute to social media gaming addiction. For example, Gong, Zhang, Cheung, et al. (2019) revealed that individuals' desire for online group gaming can significantly impact habit and self-regulation deficiency and ultimately lead to online social game addiction. Houghton et al. (2015) supported this argument in an empirical study that reveals that 16-year olds exceeded the recommended < 2 hours per day for online gaming. It is also worth mentioning that online multiplayer (social) gaming is considered the most preferred play by adolescents, followed by the single online gaming method and offline gaming (Gong, Zhang, Chen, et al., 2019). The addictive behaviour of adolescents to social media can be strongly linked to their frequent associated use of online games which run on social networks such as

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Facebook. According to Afe et al. (2020), social media networks provide ‘lives’ or ‘credits’ and offer instant ‘refills’ to players when they log on through their social media accounts, as in ‘Candy Crush’. In addition, players could even get more incentives when they invite other social media contacts to join them in a game. In this regard, young online gamers might find it hard to regulate their online/offline game time compared to adults, mainly due to a high-level self-regulatory deficiency (Gong, Zhang, Cheung, et al., 2019).

Although social media gaming and social media gambling share similar features like access and engagement, the two can differ in rewarding. King et al. (2014) categorized online gambling into online simulated gambling—which does not involve monetary rewards, and online gambling—which involves monetary gains and rewards. With the increasing use of digital technologies at a younger age, unrestricted gambling has become more available than real-life gambling, which has physical and geographical restrictions. A recent study by Gong, Zhang, Cheung, et al. (2019) discovered that social media platforms like Facebook provide a hub for game makers, distributors, and consumers to conduct transactions simultaneously through fast and easy payment methods. Based on the factors mentioned earlier, it was anticipated that an underage social media user could quickly fabricate his personal information to get access to social media gambling activities (Chou et al., 2019), thus concealing actual use of social media networks parents. This is also supported by Hadlington et al. (2019), who found evidence that children have deceptive strategies to play games on their digital devices. In addition, most parents were found to lack an understanding of the rules and boundaries concerning social media use at home.

Our literature review showed that the high engagement and involvement of children and youths with mobile phones is another factor leading to social media addiction. The need to connect, stay connected and fear of missing out are some of the triggering factors leading to excessive involvement with mobile social networking. Furthermore, teenagers and young users are perceived to be highly engaged with their mobile devices (Primack et al., 2017; Swar & Hameed, 2017), and accessing social media through these devices might lead to an increased engagement with mobile phone technologies. In addition, since social media spaces allow individuals to behave anonymously and pretend to be whoever they want, young users are likely to experience low self-control

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10 by avoiding real interactions with others (D'Souza, 2019a). Kircaburun and Griffiths
11 (2018) discussed the possibility of linking specific personality profiles and self-liking
12 to young people's addiction to Instagram. This can be explained by the fact that young
13 Instagram users usually exhibit recognition and social needs (Ponnusamy et al., 2020).

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15 Sharing of information is one of the distinctive features of social media sites
16 compared to non-social media sites. Social media providers have created different
17 methods and channels where multimedia information can be shared within and across
18 platforms to many audiences (Akin, 2017). Numeric data, such as the number of views,
19 followers/subscribers, and likes, are also generated when others interact with the shared
20 data (Balcerowska et al., 2020). For example, according to Throuvala et al. (2018),
21 users share pictures, audio, video, and text messages to get instant gratification and
22 validation (views, share, and comments). The flexibility to share materials (personal
23 information, pictures, videos, interest, hobbies, and location) through social media sites
24 can be partially attributed to their intended function (Masters, 2015), allowing users to
25 connect to communities and virtual game worlds easily.

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31 Shane-Simpson et al. (2018) explained the knowledge gap between adults who can
32 identify and manage their sharing activities through privacy settings and children who
33 might find it hard to distinguish between what is appropriate and inappropriate to share.
34 Another aspect worth mentioning is that having a complete detailed public profile on
35 social media could expose users to targeted advertisements, unwanted contacts and
36 contents, and lead to unintended and excessive disclosure (Al Saud et al., 2019).
37 Consequently, increasing the user's time spent on social media may result in social
38 media addiction. This has been further discussed by Pittman and Reich (2016), who
39 demonstrated the role of social media platforms in providing a high level of social
40 engagement experience for online users. For instance, image-based mobile-friendly
41 social media platforms like Instagram and Snap Chat (commonly used by teens and
42 adolescents) provide a higher level of communication apprehension than text-based
43 platforms like Facebook and Twitter (ibid) (Punyanunt-Carter et al., 2017). These
44 platforms offer users multiple options to edit or modify and share their videos and self-
45 portraits (selfie) in return for self-satisfaction.

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53 The review also suggests a considerable influence of sexting on users' addictive
54 behaviour. Sexting is the act of sending, receiving, or forwarding explicit text, video,
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10 audio, and pictures, which are related to sexual activities and behaviours using a digital
11 medium and mobile technology (Brailovskaia & Teichert, 2020). Sexting usually
12 occurs within a small group of people and is popular among youths between the ages
13 of 15-24. Sexting among young people is also believed to harm users' social, physical
14 and cognitive development, which could be a gateway to unwanted behaviours in the
15 future (Afe et al., 2020). It is possible that adolescents' lack of self-regulation and
16 cognitive development to understand the concerns and implications of the sexual
17 materials they are sharing may have influenced their addictive behaviour on social
18 media platforms. Also, other users' obtainable materials from social media make it
19 easier for young users to use them for other purposes besides their posting and viewing
20 activities (Throuvala et al., 2019). The ubiquitousness of social media access can
21 influence obsessive behaviour towards sexting in young users and develop dependency
22 and addiction to such content over time.
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30 **4.1.2 Technological**

31 Various technological factors have been addressed in the literature concerning
32 addictive behaviour. Our review of the literature showed that parent's knowledge of
33 technology and the Internet could influence selection of a mediation strategy (Shin,
34 2015), which may either encourage or discourage their children's use of the Internet, as
35 highlighted by Padilla-Walker et al. (2018) and Nelissen and Van den Bulck (2018). In
36 general, parents tend to adopt a careful mediation strategy to regulate their children's
37 access to online content, amount of use, and media type (e.g., mobile, tablet, and cell
38 phones). Hawi and Rupert (2015) argued that young users whose parents use the digital
39 screen as a discipline tool tend to stay online longer than those whose parents do not.
40 Lately, young users access social media through their personal computers and more
41 often through their mobile devices (Chou et al., 2019), making it a little harder for their
42 parents to control their online activities actively. Ghosh et al. (2018) explained that
43 teens and children consider mobile devices as their personal and private spaces, which
44 results in parents being unable to monitor their children's use of social media. In
45 addition, parents' non-interference policy is commonly found among those who try to
46 avoid parent-child tension (Nelissen & Van den Bulck, 2018). The emergence of new
47 social media sites and the rapid migration of users from one platform to another makes
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10 it harder for parents to keep up to date with their children's online activities (O'Keeffe
11 & Clarke-Pearson, 2011). Shin (2015) explained how parental lack of technical
12 understanding of the Internet could hinder their efficiency in managing their children's
13 use of the Internet. There is evidence of children below the age of 13 having one or
14 multiple social media accounts with or without parental knowledge (Chou et al., 2019;
15 Throuvala et al., 2019), and thus increasing their addiction risk to these channels. This
16 is largely due to the technology and experience that goes along with it. Social media
17 networks like Instagram and Snap Chat have the potential to capture the user's personal
18 experience through mobile devices (Humphreys, 2013). This will help the social media
19 platform customize the user's experience and enable online users to communicate and
20 interact in real-time with others (mainly through sharing files and messaging). This
21 makes young age users more vulnerable to social media addiction (Chou et al., 2019),
22 which could also be linked to social media's omnipresence and its data-sharing policies
23 (Throuvala et al., 2019). In addition, internet-equipped mobile devices make it easier
24 for social media young age users to continually connect with social contacts, making
25 mobile devices the primary source of access.
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32 This study showed that specific technological developments and key industry trends
33 impact how young people consume social media content. For example, Shane-Simpson
34 et al. (2018) explained how technological affordances could draw social attention to
35 one's thoughts, ideas, opinions, or experiences. Furthermore, site affordance has also
36 been found to play a role in the excessive use of social media among young age users.
37 In line with this argument, Choi and Sung (2018) made it clear that media affordances
38 can influence an individual's decisions to use a specific social media network or
39 persuade an individual to exhibit a behaviour in response to the excessive use of social
40 media networks. As such, the affordance of a social network could create tension
41 between privacy and social capital. This is evident from the work of Shane-Simpson et
42 al. (2018), who surveyed young students' use of either Facebook, Instagram, and
43 Twitter. The findings showed that teenagers and young adults often use a social media
44 site that grants them popularity through social capital over other social media sites that
45 offer comprehensive privacy settings. Although a limited number of social media users
46 are aware of the privacy settings available to them, they rarely change their privacy,
47 security, and account settings, even if they are aware of it. This led us to believe that
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addicted users can willingly share their contents for social gains regardless of the consequences. According to Padilla-Walker et al. (2018) and Nelissen and Van den Bulck (2018), parents' low technological literacy and passive co-use families may create an overall media climate or style related to young users' media use that might also be related to their addictive behaviour.

In summary, studies mentioned above support the claim that site affordance, Internet access, parents' technological literacy, and passive co-use can promote young users' excessive social media sites (Gul et al., 2018), thus increasing addiction vulnerability. The studies also emphasized that young users are likely to compromise a certain level of privacy to gain social capital. These factors could lead young users to become emotionally attached to their mobile phones, spend excessive time on social media, and overshare information.

4.1.3 Social

Social factors refer to individuals' feelings, emotions, and personal experience towards using social media in this study. Our literature review showed a range of positive outcomes related to young users' use of social media. For example, O'Keeffe and Clarke-Pearson (2011) explained how Facebook might enable high school students to regroup outside school hours and discuss educational activities. Social media is believed to have both positive and negative effects on individuals depending on the motive. Other previous studies (e.g., Atroszko et al., 2018; Pittman & Reich, 2016) have addressed how people with low satisfaction in relationships, lacking social skills, or moral support might turn to social media to fulfil their social needs and satisfaction. Our review also showed that young users' use of image-based sites could play a key role in reducing loneliness while increasing happiness and satisfaction with life. This is because image-based social network sites, patronized mainly by younger people, offer more intimate relationships among users (Pittman & Reich, 2016). Features like "self-destruct" and filters function on Snap Chat, short video clips, and picture enhancement on Instagram are believed to offer an environment for users to have more control and confidence over what they share. In return, instant response and validation from other social group members could provide the comfort and support needed to increase

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9 gratification, satisfaction, and feeling of self-worth among users who are predominantly
10 teenagers and young adults (Choi & Sung, 2018).

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12 Furthermore, aspects related to self-disclosure on social media have always been a
13 concern for researchers. Social media is a platform where users view contents based on
14 what personality, persona, profile, or self-identity they intend to portray (Isada & Isada,
15 2019). Our review showed that a limited amount of online self-disclosure is needed in
16 order for users to set up and maintain a social media account. This may include; name,
17 gender, interests, email address, and pictures (Du Preez & Lombard, 2014; Shane-
18 Simpson et al., 2018). In addition, what to disclose on social media about oneself could
19 be related to an individual's age, gender, site affordability, interests, and privacy
20 concern. This has been further investigated by Pittman and Reich (2016) and Shane-
21 Simpson et al. (2018), who argued that image-based social media networks like
22 Instagram and Snap Chat offer more intimate relationships and a high level of social
23 presence among groups when compared to text-based sites like Twitter and Facebook.
24 However, Choi and Sung (2018) claimed that text-based sites might offer more complex
25 and sophisticated privacy settings than image-based sites, allowing users to disclose
26 their preferred or enhanced self-image easily. In this regard, young users are more prone
27 to engage in risky online activities due to their inadequate knowledge of issues related
28 to privacy.

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30 Active social engagement in social networks is also believed to play a vital role in
31 adolescents' identity development process, civic engagements and positive outcome
32 towards future social change (O'Keeffe & Clarke-Pearson, 2011; Throuvala et al.,
33 2019). Meanwhile, our review of the literature showed how social capital could be
34 considered as one of the outcomes of using social media, which could also be further
35 described in two ways: Capital bonding–gratifications received from bonding with
36 inner circle connections– and bridging social capital–gratifications received from
37 casual friendship (Shane-Simpson et al., 2018). Although the literature showed that
38 adolescents might face some negative experiences from using social networks–mainly
39 due to unruly behaviours like cyberbullying, stalking, social engineering and online
40 harassment (Baccarella et al., 2018; O'Keeffe & Clarke-Pearson, 2011; Tayouri, 2015)–
41 getting validation from others can contribute to users' satisfaction through social media
42 engagement. This has been further discussed by Köse and Doğan (2019), who argue
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10 that young users who spend a long duration on their mobile phones are likely to receive
11 gratification from others, which is linked with enhancing self-identity and self-esteem.
12 For instance, a teenager suffering from low self-esteem can access online social media
13 to communicate with groups of people facing the same challenge through mobile
14 devices (Hawi & Samaha, 2017).
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17 Meanwhile, our review showed that young individuals who experience loneliness
18 are generally more likely to turn to online social because of their desire to receive
19 recognition from others (Ponnusamy et al., 2020; Yang, 2016). Based on this, it can be
20 anticipated that young users, in return, can have private access to information and
21 support needed and, most importantly, will have a sense of belonging (Casale &
22 Fioravanti, 2018; Isada & Isada, 2019).
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25 The literature also showed the role of family members in influencing young users'
26 perceptions and use of social media. For example, Nelissen and Van den Bulck (2018)
27 found out that parental mediation can be an effective means for determining the
28 frequency of Internet use by children. The authors further explained how website
29 recommendation (for educational purposes) and co-use mediation strategy could
30 increase online engagement in young users, especially at home. In addition, parents'
31 perception of usefulness to a particular social media site may help them set policies for
32 either restricting or allowing their children to engage in a specific social media activity
33 (Topalli, 2016). It is also worth mentioning that young users/adolescents are vulnerable
34 to peer pressure due to their limited self-regulation and persuasible nature (Throuvala
35 et al., 2019). This is probably because adolescents put themselves on social media for
36 peer review (peer comparison, peer evaluation, peer validation, and peer feedback)
37 (Throuvala et al., 2019). Adolescents enrich themselves through social capital, which
38 involves personal disclosure, preferably through Snap Chat and Instagram (Pittman &
39 Reich, 2016; Throuvala et al., 2019), in which maintaining social media capital is
40 reciprocal. This means that users need to constantly update their status, pictures, videos,
41 and viewing and commenting on other users' updates, which requires omnipresence. In
42 addition, increasing the time spent on social media (Primack et al., 2017), primarily due
43 to the instant access and Internet-enabled mobile devices, may substantially trigger the
44 users' fear of missing out on content (Hamutoglu et al., 2020). As such, some
45 behavioural problems like withdrawal and anxiety may develop. Fang et al. (2020)
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10 found that emotional support from social media would strengthen fear of missing out,
11 which in turn facilitates phubbing behaviour among young individuals. Tunc-Aksan
12 and Akbay (2019) added that the fear of missing out could effectively predict social
13 media addiction among adolescents. The results from these previous studies revealed
14 that the fear of missing out among adolescents affected problematic social media use.
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18 **4.1.4 Mental**

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20 Mental health in the context of this study refers to a broad range of activities related
21 to the mental wellbeing component directly or indirectly. Young users' addiction to
22 social media is likely to positively and negatively influence their mental health
23 (D'Souza, 2019a). Our literature review showed that young users' excessive
24 involvement with mobile phone applications could negatively impact their general
25 wellbeing (Hawi & Samaha, 2017; Masthi et al., 2015; Taylor, 2020). Specific
26 addiction symptoms related to users' mental health, such as withdrawal and distraction,
27 are commonly linked to increased engagement with social media platforms (Walsh et
28 al., 2010). Jeri-Yabar et al. (2019) revealed that young users' excessive social media
29 use could be linked to depressive symptoms, especially among users who prefer Twitter
30 over Facebook and Instagram. This was further explained by O'Reilly et al. (2018),
31 who reported that social media use might directly cause ill mental health such as
32 depression and suicidal ideation.
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38 In addition, young addicted users to social media are likely to be exposed to
39 behaviours that could negatively influence their emotional wellbeing, such as
40 cyberbullying. Social anxiety is another factor that may lead individuals with low self-
41 efficacy and high social anxiety to actively engage in different online social networking
42 activities (Wegmann & Brand, 2016). According to Atroszko et al. (2018), young users
43 with social anxiety could get involved in activities on the social space to escape from
44 real-life stress.
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4.2 Parental and social media platform providers' role in preventing addiction

In general, parents are the most critical agents in children's physical and social development (Hawi & Rupert, 2015; Nelissen & Van den Bulck, 2018). The literature showed that parental use of digital media (television, video games, Internet, and new media) could influence their children's use and vice versa (Lee & Chae, 2007; Nelissen & Van den Bulck, 2018). There have been many questions recently about the shortage of empirically-based research on digital media use amongst young individuals, especially on guidelines related to the amount of screen time per day. Our literature search revealed that the recommended screen time for children—according to the American Academy of Paediatrics (AAP) guidelines—is two hours per day (Hawi & Rupert, 2015). Accordingly, inactivity, long sedentary time (including screen time), and lack of sleep may impact young individuals' physical and mental wellbeing. Therefore, solving these problems would help prevent future unwanted health problems among young social media users.

Our review shows how parents' media use could either increase or decrease the time their children spend on the Internet (Lee & Chae, 2007; Valcke et al., 2010). Usually, parents adopt passive or active strategies to control their children's access to digital media and use computer and mobile applications (Ghosh et al., 2018). According to Hawi and Rupert (2015) and Chou et al. (2019), three types of commonly used parental media mediation strategy, namely, Restrictive use, Active use, and Co-use. Our literature search revealed that 'Restrictive Mediation' was the most commonly adopted strategy by parents because it makes them feel confident when they monitor their children's online activities and total time spent on media. This takes place when parents place computers and digital media devices in shared rooms. However, restrictive mediation might not be effective when the child leaves home, or when the child grows older. Also, this strategy might be ineffective for working parents. The second commonly adopted strategy was 'Active Mediation'. Some scholars (e.g., Ho et al., 2017) argue that active mediation is the most effective mediation strategy because it involves active engagement in monitoring what young users do online. This strategy involves a conversation between parents and their children regarding digital media,

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mainly by asking questions and recommending valuable websites. Our review also showed that the least favourable parental digital media strategy was the 'Co-Use'. There are potential benefits related to co-use mediation strategy. For instance, Lee and Chae (2007) explained that co-use can lead to positive media and Internet use among young users. The authors believed that home is the main place where young individuals get access, and thus extending time on digital media and the co-use strategy could facilitate learning within the home environment. However, Ghosh et al. (2018) reported that the co-use of social media within family life requires disclosure from both parties, which might lead to a conflict of interest. This includes the potential of experiencing parent-child tension due to co-use, especially when parties disagree regarding which contents are appropriate to share on the social media platform. According to Ilakkuvan et al. (2019), co-use may increase users' time spent on digital media.

From a platform provider's point of view, there have been many attempts to prevent social media action among young users. However, **few reports were found in the literature on effective methods of stopping or controlling excessive use of social media by young users.** According to Chou et al. (2019), Facebook provides comprehensive privacy settings for users to control their public profiles, which, if implemented correctly, could directly or indirectly reduce some of the factors like excessive disclosure and time spent on social media. This, however, has been argued by Alkeinay and Norwawi (2014), who found that a lot of young users are either not aware of these settings, find the settings complicated or intentionally compromise privacy settings for social gains and popularity. The second method which platform providers use to control underage access to social media is 'Age-Restriction'. According to Chou et al. (2019), even though specific social media sites like Facebook has set their age requirements for users to be at least 13 years and above, the authors revealed that several underage users were found to have active online accounts. Underage users can get social media accounts through the help of relatives, friends, and age fabrication. Based on these, it can be said that parental and social media providers' role in preventing social media addiction in young individuals is continuously customized following the emerging behavioural patterns of its users.

Figure 2 shows the distribution of the mentioned factors across social media platforms. Other social media platforms such as Snapchat, YouTube, Blogs, QQ,

WhatsApp, and WeChat were not included in this illustration due to the limited number of studies conducted on these platforms (see Table 1 for more details about factors for each platform).

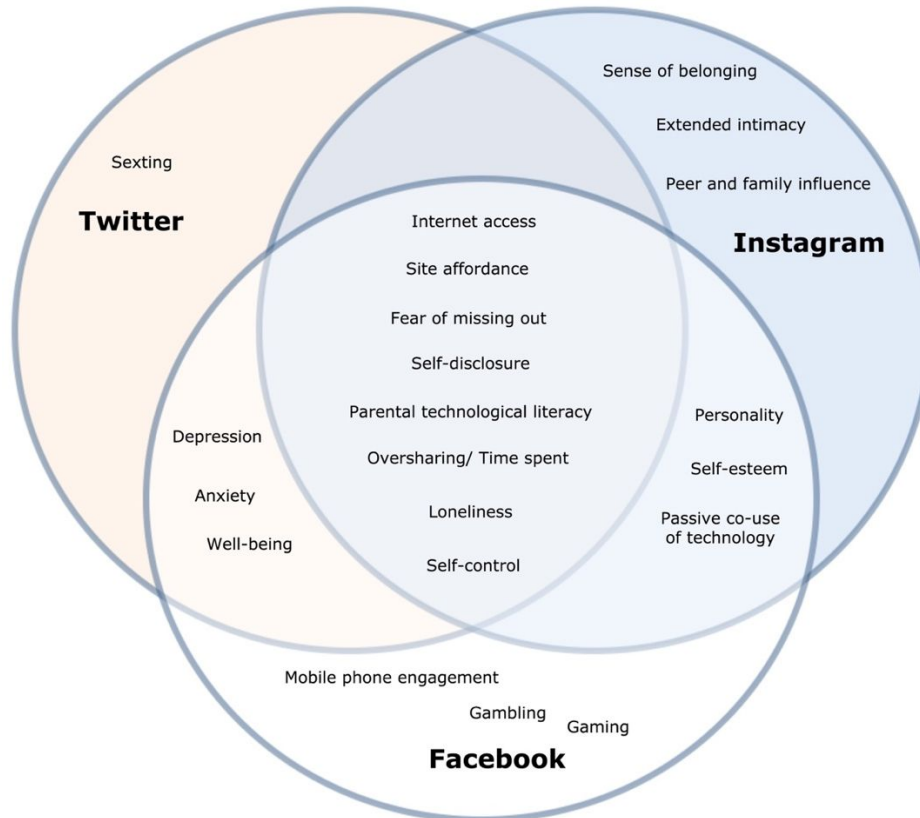


Figure 2: Distribution of social media addiction factors across platforms

5. Discussions

This study reviewed the significant factors affecting young users' social media addiction (see Figure 3). Factors such as self-control, gambling, gaming, sexting, oversharing/time spent, personality, and mobile phone engagement were found to function as a reinforcement, further encouraging problematic use of social media tools/services. Low self-control, personality, and mobile engagement among young users appeared to be more associated with problematic social media sites. This finding

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10 is supported by the cognitive-behavioural model of generalized problematic Internet
11 use (Davis, 2001). Negative mood states can be a potential factor in stimulating
12 individuals' online interactions for mood regulation (a behaviour associated with a
13 deficiency in self-control, personality, and sexting). Time spent was also found to play
14 a critical role in facilitating young users' addiction to social media. This finding is
15 consistent with previous studies (e.g., Babalola et al., 2017; Osatuyi & Turel, 2018),
16 which argued that users' habit of constantly checking online social media profiles could
17 result in automatic use and produce addiction symptoms even at the detriment of other
18 activities such as educational and career pursuit.
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23 Nevertheless, the relationship between poor interpersonal skills and individual
24 problematic use of social media is a cause or a consequence of excessive
25 oversharing/time spent on the Internet. It is reasonable to assume that addictive use of
26 other online tools (e.g., games, dating apps, online searching, etc.) can be linked to the
27 decline in individuals' communication and ties with others and because of this, young
28 users are likely to become socially isolated and no longer able to socialize in person
29 with others. In addition, gambling and gaming were found to facilitate young users'
30 problematic use of social media sites in that a high dependency on online
31 games/gambling activities can result in interpersonal difficulties and stress in reality.
32 Users' engagement in such activities can lead a person to engage in social media use as
33 an alternative to relationships in real life.
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39 The study linked certain technological factors to parental technological literacy, site
40 affordance, Internet access, and passive co-use of technology. These links can
41 contribute to the parental mediation theory for the digital age (Clark, 2011) in that it
42 shows how parents interpersonal communication with their children can mitigate the
43 negative features of problematic social media use. In addition to the parental mediation
44 strategies (e.g., active, restrictive, and co-viewing), this study showed that the specific
45 characteristics of technological and essential characteristics of parental
46 behaviour/attachment could contribute to the development of problematic use of social
47 media sites. Parents with low levels of risk perception and parental mediation efficacy
48 are less likely to apply restrictive parental mediation of children's use of technology
49 (Chang et al., 2019). Several prior studies (e.g., Ihm, 2018; Xie et al., 2019) support the
50 assumption that increased parent-child attachment, children's self-reported Internet
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10 safety literacy, and restrictive parental mediation of children's use of technology can
11 potentially reduce users' addictive use of social media sites. Our review also showed a
12 lack of evidence about the impact of technological characteristics provided by a specific
13 social media site on young users' addictive behaviour.
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15 This study found that social factors in terms of low self-esteem, disclosure, and
16 loneliness can promote users' dependent behaviours that can be further affected by the
17 qualities of peer relationships. According to Park (2019), functionally dependent users
18 are more likely to change their dependent behaviours than existentially dependent users.
19 In addition, users of social media spaces tend to form strong peer relationship and a
20 sense of belonging with other users in the same space. Such a climate allows online
21 users to create a relationship that satisfies their needs to belong to a community.
22 However, most of the reviewed studies did not specify how users' engagement in
23 specific social media activities can contribute to their preferences for online
24 socialization. It is reasonable to assume that negative perceptions about communication
25 competence are more pronounced among lonely users. This assumption can be
26 extended to include fear of missing out and extended intimacy as a driver of users'
27 addiction to social media sites.
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34 Certain mental factors in this study were mainly associated with users' wellbeing,
35 anxiety, and depression. According to the theory of problematic internet use and
36 psychosocial wellbeing, people who experience various forms of psychosocial distress
37 may develop a preference for online social interaction as they perceive it to be less
38 threatening and more rewarding than other means of interaction. This finding supports
39 the view of Caplan (2003) that those people who prefer online social interaction may
40 engage in compulsive and excessive use of some synchronous applications to the point
41 that they suffer adverse psychological consequences. On the other hand, other
42 behavioural and social factors might have contributed to the mental health status of
43 users. For example, game addiction scores can promote individuals to develop
44 aggressive tendencies. Our review debated whether the time spent on a game would
45 facilitate the gamers to develop depression and related anxiety disorders. Even though
46 some studies have reported that the amount of violent video gameplay is correlated with
47 self-reported levels of aggression, other studies conclude that mental health issues
48 might not always be associated with an online game. However, the impact of
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behavioural, technological, and social differences on individuals' mental health has not been appropriately considered.

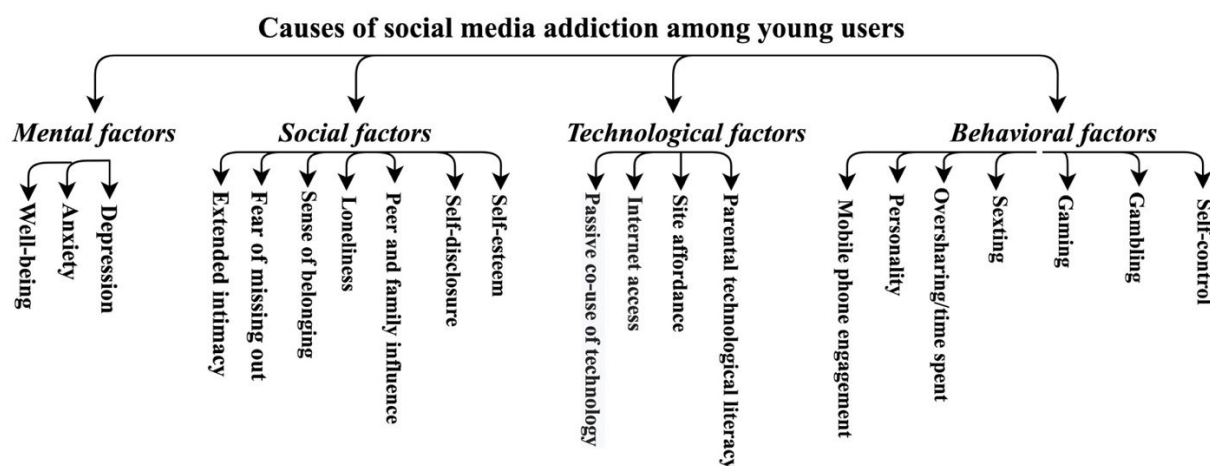


Figure 3: Causes of young users' addiction to social media platforms

Furthermore, this study indicated that social media platforms are likely to pose potential risks to younger users such as increased dependency and exposure to inappropriate content, anti-societal behaviours. Hence, previous studies have recommended effective ways or possible actions to prevent the factors that cause social, technological, mental, and behavioural addiction associated with social media use. This study showed that parental media mediation strategies, namely; restrictive use, active use, and co-use, can help young users become more aware of risks associated with the problematic use of social media. The review revealed that active mediation and co-using could more effectively protect young users from social media addiction than restrictive mediation. Active parent-child discussions regarding media and their content can promote users' critical thinking skills and become able to protect themselves from addiction-related risks. However, parents are likely to engage in parental mediation when they perceive addiction as a severe problem (Hwang et al., 2017). Because of that, prior studies were unable to capture various types of social media dependence that vary depending on each user. Hence, it is possible to assume that young users' problematic use of social media dependence may vary depending on each user's

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motivation and perception of using the social space, as supported by Ponnusamy et al. (2020). It is also worth mentioning that social media spaces that offer significantly less sophisticated privacy controls (e.g., Instagram) than general-purpose sites can potentially make it easier for people to be more prone to addiction.

6. Theoretical Implications

This review contributes to the social cognitive theory by highlighting the importance of social media platforms in facilitating addictive behaviour patterns due to their role in providing different self-presentation and exposure styles. It is believed that factors associated with using social media platforms can further extend the relationship between beliefs and behaviour in which young users are free to select, react to and learn from others. The work also contributes to the parental mediation theory for the digital age (Clark, 2011) by adding to the conception that parental media mediation styles can result in different levels of awareness between parents and children concerning the forms of social media interactions. Identifying different behavioural, technological, social, and mental factors about young users' use of social media sites can extend the theory of problematic internet use and psychosocial wellbeing (Caplan, 2002) and the cognitive-behavioural model of generalized problematic Internet use (Davis, 2001).

7. Recommendations

To help platform operators, parents, social media specialists, addictive behaviour researchers and clinicians understand ways to mitigate the problems associated with social media addiction among young users, this study proposes the following strategies:

1. Behavioural: One of the strategies to curb addictive behaviours of younger users is by staying away from deviant social referents. The review found that younger users are drawn to the perceived norm of deviant role models through observational learning. This usually reduces individuals' interaction and communication with social communities/involvement in community activities or even total abstinence. Therefore, younger users should always seek help from families who do not engage in addictive social media practices. Families and organizations can encourage more offline healthy social activities such as

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10 family parties, meeting with friends, and attending cultural events. Similarly,
11 guardians or parents with younger adults should frequently evaluate their
12 children's social behaviours when using social media sites.

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14 2. Technological: Targeted policies to provide adequate information and warning
15 by social media platform developers regarding the susceptibility and severity
16 of prolonged usage time in the platform can be overemphasized. The
17 symptoms of technological platform addiction include salience, mood
18 modification, tolerance, withdrawal, relapse, and conflict. Therefore, young
19 users should be aware of the possible adverse consequences and symptoms of
20 social media addiction such as technology-family conflict, technology-work
21 conflict and technology-person conflict they can experience due to loss of
22 sustained self-control. Furthermore, platform developers, government
23 agencies, and parents should recognize the views of younger users concerning
24 the development and promotion of effective technology-related boundaries for
25 positive technology use. Parents or guardians should be digital literate in order
26 to adopt and implement any technology-related boundaries carefully, thus
27 enabling them to regulate their children's access to social media content
28 effectively, amount of use, and the type of platform to use.

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35 3. Social: This study recognizes that people with low satisfaction in relationships,
36 lacking social skills or moral support often turn to social media to fulfil their
37 social needs and satisfaction. Society and families should provide
38 environments where younger users feel they have more control, confidence,
39 comfort and support to increase gratification, validation, satisfaction, and self-
40 worth among users. Younger users' views should be considered by parents
41 when attempting to develop a mediation strategy or get involved in the online
42 life of their underage children. For example, parents and platform providers
43 should consider educating young users on the consequences of sharing their
44 contents for social gains, being emotionally attached to their mobile phones
45 and spending excessive time on social media. Another key recommendation is
46 that younger users should be able to access appropriate support if they are
47 exposed to risks such as data breach, security and privacy concerns. Families
48 and organizations should be encouraged to facilitate discussions about social
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media use within and outside of the home to understand how positive and regulated technology use among younger users can be promoted.

4. Mental: It is evident in this study that lack of sleep may impact physical wellbeing and the mental wellbeing of young users. Therefore, encouraging quality sleep time among young individuals would help prevent future unwanted health problems. A diagnosis should be made if younger users exhibit several symptoms indicating dependence syndrome, resulting in their neglect of other social functioning such as family and offline friends in everyday life. Knowing privacy issues and conscientious use of social media sites can help younger adults build a decent digital footprint that can support their mental wellbeing, protect their future reputation, or even future jobs and college acceptance and reduce their exposure to marketers and fraudsters. Respecting the law or legitimate restrictions such as age limits and active conversation between parents or guardians and younger adults is crucial for successfully dealing with cyberbullying and social anxiety. Online safety, citizenship, and healthy behaviour must focus on such conversations and ensure that both parties do not send mixed messages and engage in punitive actions unless truly warranted.

5. Limitations and Future Research

This study significantly adds to the existing literature on behavioural, technological, mental and social addictions and provide valuable insights into the nature of the relationship between the amount of time spent on social media and social media addiction. However, there are some limitations which include the non-generalisability of the findings in the reviewed papers. Many of the articles were often based on one region, one social media platform, self-reports and limited to university students, which may not be a sufficient representation of the online behaviour of all younger users.

The wide use of the cross-sectional approach and correlation analysis by many reviewed studies may not necessarily offer a deep understanding of the subject matter. As a result, it is not very easy to state which variable is the cause and its effect. Therefore, adopting a longitudinal design would be much more helpful in determining

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9 the effects of social media use on mental health. The data from such a design will enable
10 us to draw definite conclusions on the causal-effect relationship. Future studies can
11 adopt a generic assessment approach to examine other variables related to social media
12 usage such as motives for use, activities users engage in, patterns of use (e.g., active vs
13 passive) and their relationship to the factors that cause social media addiction. Future
14 studies should investigate the differences between addictions to particular social media
15 platforms to determine which platform addiction is the biggest contributor to young
16 users' behavioural, technological, social and mental harm (e.g., deteriorated wellbeing).
17 Consequently, such studies would drive therapeutic interventions focusing on the most
18 impactful social media platforms.
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25 **Conflict of interest:**

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27 On behalf of all authors, the corresponding author states that there is no conflict of
28 interest.
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