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Online Social Network Site Addiction: A Comprehensive Review

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Abstract Research into online social network site (SNS) addiction (i.e., excessive and compulsive online social networking) has expanded over the last years. This paper aims to give a review of this research. Although not formally recognized as a diagnosis, SNS addiction shares many similarities with those of other addictions, including tolerance, withdrawal, conflict, salience, relapse, and mood modification. Several screening instruments to identify SNS addicts have been developed—approaching the phenomenon in various ways, disclosing a conceptual and empirical obscurity in this field. Theoretical and empirical models suggest that SNS addiction is molded by several factors; including dispositional, sociocultural, and behavioral reinforcement. Also, empirical findings generally unveil that SNS addiction is related to impaired health and well-being. There has been little, if any, empirical testing of prevention or treatment for this behavioral addiction, although certain self-help strategies, therapies, and interventions have been proposed.

Keywords Addiction · Assessment · Facebook · Overview · Online social networking · Treatment

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Introduction

Online social network sites (SNSs) (Facebook, Twitter, Instagram, etc.) are familiar to most people, as more than one billion of us use one or more of these on a regular basis [1•, 2]. Online social networking is thus by far a normal modern behavior. Pathological forms of normal and necessary behaviors (e.g., exercising and shopping) have received increased attention in recent decades [3•, 4, 5] as scholars have recognized striking similarities between chemical addictions (drug dependence) and non-chemical persistently excessive behaviors (pathological gambling) [4, 6–10]. Chemical and behavioral addictions have seven core symptoms in common: salience, tolerance, mood modification, conflict, withdrawal, problems, and relapse [4, 11]. Excessive and compulsive online social networking behavior has recently been suggested as a behavioral addiction [12•, 13••, 14••], although it is not formally recognized or embedded in current psychiatric nosology [15]. This paper provides an overview of the recent literature on SNS addiction and covers topics such as conceptualization, prevalence, assessment, antecedents, outcomes, and potential interventions (see Fig. 1).

SNS Addiction Defined

Andreassen and Pallesen [12•] [p. 4054] define SNS addiction as "being overly concerned about SNSs, to be driven by a strong motivation to log on to or use SNSs, and to devote so much time and effort to SNSs that it impairs other social activities, studies/job, interpersonal relationships, and/or psychological health and well-being". This definition reflects the aforementioned addiction symptoms [11]. They argue that SNS addicts typically spend a lot of time thinking about SNSs and on how they can free up more time for online social

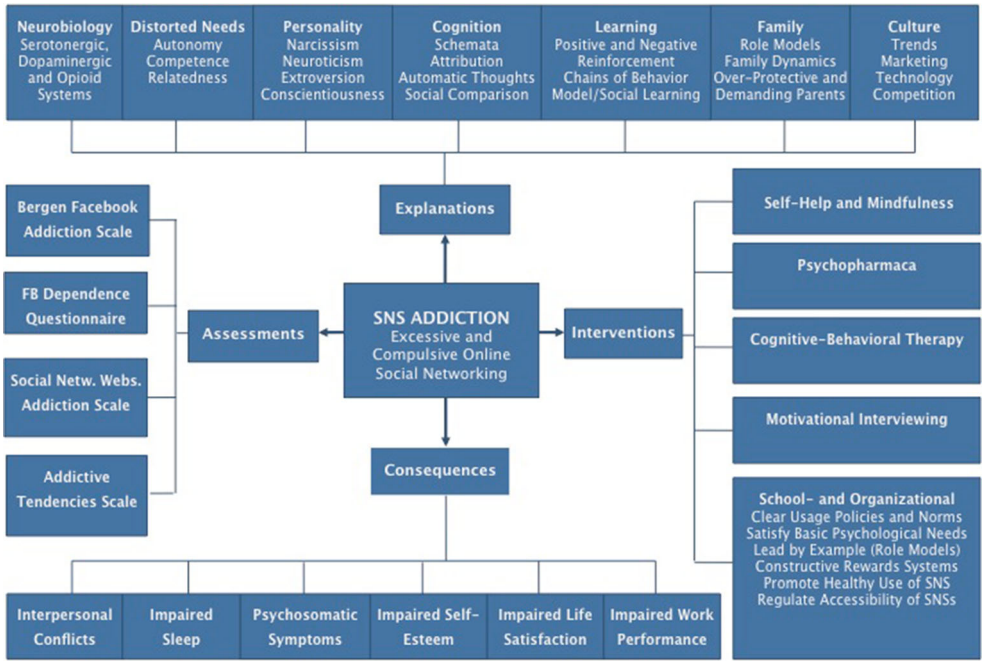

Fig. 1 The figure gives a brief schematic overview of the SNS addiction field in terms of definition, particular measurements, explanations, consequences, and interventions for SNS addiction

networking (salience). Often, they spend much more time social networking than was initially intended, feeling an urge to social network more and more in order to attain the same level of pleasure (tolerance). They use SNSs in order to reduce feelings of guilt, anxiety, restlessness, helplessness, and depression, in order to forget about personal problems (mood modification). If prohibited from SNSs, addicts typically become stressed, restless, troubled, or irritable, and feel bad if they cannot engage in social networking (withdrawal). They do not heed the advice of others to reduce time spent social networking. Still, they have typically attempted to cut down on social networking without success. When they decide to use social networking less frequently, they do not manage to do so (relapse). SNS addicts give a lower priority to hobbies, studies/job, leisure activities, and exercise, and ignore their partners, family members, or friends because of SNSs (conflict). SNS addicts often use SNSs so much that it negatively influences their health, sleep quality, relationships, and well-being (problems).

Some may argue that the concept of "SNS addiction" represents an unnecessary pathologization of a normal behavior extremity. However, there seems to be empirical support for the notion that certain individuals display SNS-related behavior that is compulsive and uncontrolled, which best can be understood in an addiction perspective [3•, 12•, 13••, 14••, 16••]. Furthermore, a key distinction between normal over-engagement in social networking (occasionally experienced by many) and SNS addiction is that the latter, in contrast to the former, is associated with *unfavorable consequences*, and that social networking becomes *uncontrolled* and *compulsive*. In short, overly engaged social networkers remain in control [17]. They appreciate other activities and lead multidimensional lives. However, for SNS addicts, anything that interferes with social networking is disfavored. Even though the behavior results in unwanted consequences, such as insomnia or relational conflicts, the SNS addict upholds the behavioral pattern, in parallel to other addictive behaviors [11, 12•, 13••, 18]. Thus, SNS addiction is something qualitatively different from excessive time spent on SNSs (as people can spend many hours on these platforms for numerous reasons without being addicted to it) or logging onto SNSs first thing in the morning and last thing before going to sleep at night.

Epidemiology of SNS Addiction

Scholars argue that SNS addiction has risen, especially with new technologies (laptops, smartphones) [12•]. However, robust statistics of the prevalence of SNS addiction is currently hard to come by. Prevalence studies usually involve small and non-representative student samples employing various screening methods and cut-off regimes [12•, 14••, 16••]—making it difficult to compare results across studies. However, recent review articles of the more empirically explored phenomenon of *Internet* addiction, suggest that 2 % of U.S. adults are addicts [5]. Facebook addiction studies report prevalence rates of 1.6 % [19] and 8.6 % [20] whereas 12 % has been reported to be problematic users of SNSs [21], and 34 % [22] to Xiaonei (a Chinese SNS). The low prevalence rate of 1.6 % was found in a Nigerian sample, and may be explained by low level of Internet accessibility in this sample. The high prevalence rate of 34 % was found in a sample of 335 Chinese students (19–

28 years) using a modified version of Young's Internet Addiction Scale [23].

There is some evidence that SNS addiction is more prevalent in certain groups. Specifically, studies report higher estimates among younger people [3•, 13••, 24], and in females [13••], although some studies have found higher estimates among older users [25] and in males [26]. Other studies have found SNS addiction to be unrelated to age [21, 27] and gender [21, 24, 27]. A newly published study of predictors of private use of social media at work in a sample of 10,018 employees showed that such use is related to male sex, younger adults, single status, and higher education [1•]. However, this study did not measure SNS addiction.

Overall, due to the poor quality of previous research on the prevalence of SNS addiction in terms of sampling, study design, measurement, and cut-off score employed, it is premature to draw conclusions about prevalence and relevant risk factor of SNS addiction.

Measurement of SNS Addiction

Several screening instruments of SNS addiction have appeared in the literature. Researchers investigating SNS addiction have first and foremost focused on Facebook addiction, while some focus on other social networks, or SNSs in general. Table 1 briefly presents relevant screening instruments.

Bergen Facebook Addiction Scale (BFAS)

BFAS is a six-item questionnaire developed by Andreassen and colleagues [13••]. Anchored in general addiction theory, BFAS operationalizes Facebook addiction according to the following addiction criteria: *salience*, *mood modification*, *conflict*, *withdrawal*, *tolerance*, and *relapse*. All items are worded in line with diagnostic addiction criteria [15, 28, 29], and scored on a five-point scale that ranges from *very rarely* to *very often*, asking how often *during the last year* the symptoms have occurred. The composite score ranges from 6 to 30, where the cut-score is set to >3 on at least four of the six criteria (polythetic scoring). BWAS was constructed and retested in a Norwegian sample of 423 students. BFAS is a brief and has good psychometric properties [3•, 12•, 13••]. A modified version of BFAS pertaining to SNSs in general also exists (Bergen Social Networking Addiction Scale).

Facebook Dependence Questionnaire (FDQ)

FDQ is an eight-item questionnaire that measures Facebook dependence [20]. The item pool is based on an Internet addiction scale [30], and measures control, satisfaction, time of use and efforts to reduce it, worries, concern, and other activities involved in Facebook. The response format is dichotomized (yes/no), where the cut-score is endorsement of at least five items. FDQ was constructed in a Peruvian sample of 418 students. Statistical methodology involved calculation of internal consistency (0.67).

Social Networking Website Addiction Scale (SNWAS)

SNWAS is a five-item questionnaire developed by Turel and Serenko [24]. The construction was based on Charlton and Danforth's video game engagement/addiction scales [31]. All five items are scored on a seven-point scale ranging from *completely disagree* to *completely agree*. No cut-score is suggested, other than that high score indicate SNS addiction. The scale was constructed based on data from an American sample of 194 students, and satisfactory psychometric properties were obtained.

Addictive Tendencies Scale (ATS)

ATS is a three-item questionnaire developed by Wilson and colleagues [32]. Anchored in general addiction theory and research on excessive text messaging/instant messaging. ATS operationalizes SNS addiction as being comprised of three core addiction criteria: *salience*, *loss of control*, and *withdrawal*. All items are scored on a seven-point scale that ranges from *strongly disagree* to *strongly agree*. Cut-off scores are not suggested. The scale was constructed in an Australian sample of 201 students. Measure of internal consistency was 0.76.

Table 1 shows that the scale construction of existing measures mainly relies on previous research on Internet addiction/problematic use [23, 30, 34], mobile phone addiction/involvement [35, 36], videogames addiction/engagement [31], and/or Brown's [37] and Griffiths [11] behavioral addiction components. Some are founded on specific addiction criteria, while others measure only some aspects of addiction, or mere habitual use, excessive use or addictive tendencies.

Sample and statistical methodology used in the initial scale-construction studies entail common drawbacks such as small non-representative cross-sectional study designs. Because of their recent developments, their psychometric properties have primarily been tested and reserved to these initial studies so far. Also, very few scales come with suggested cut-score for categorizing SNS addicts.

There has been controversy concerning assessing specific network platforms, such as Facebook, as opposed to social networking in general. For example, Griffiths [38] and his colleagues [14••] argue for the need for validated scales that measure "social networking addiction" in general rather than "Facebook addiction" since Facebook is only one social network of many—and where a variety of activities unfold (gaming, picture posting, chatting, status updating, etc.) [38, 39]. Ryan et al. [16••], on the other hand, argue for the importance of developing scales pertaining to specific SNSs such as Facebook as there are possible differences between different sites in terms of their addictive potential. Andreassen and

Table 1 List of existing SNS addiction measures, number of items, and background

Measure	Items	Based on
Bergen Facebook Addiction Scale [13••]	6	Brown's [37] behavioral addiction symptoms, Griffiths'[11] components model of addiction, and diagnostic addiction criteria [28, 29]
Facebook Intrusion Questionnaire [65]	8	Brown's [37] behavioral addiction components and the Mobile Phone Involvement Questionnaire [36]
Facebook Dependence Questionnaire [20]	8	Internet Addiction Questionnaire [30]
Addictive Tendencies Towards SNSs [21]	20	Young's Internet Addiction Test [23]
Social Networking Website Addiction Scale [24]	5	Charlton and Danforth Online Gaming Addiction Scale (short version) [31]
Addictive Tendencies Scale [32]	3	Mobile Phone Addiction Scale [35]
Generalized Problematic Internet Use Scale 2 [51]	7	Generalized Problematic Internet Use Scale [84]
Facebook Addiction Scale [27]	8	Young's Internet Addiction Test [23] and the Problematic Internet Use Scale 2 [34]
Facebook Addiction Scale [26]	20	Young's Internet Addiction Test [23]
Facebook Addiction Scale [52]	30	Brown's [37] behavioral addiction components
Facebook Addiction Scale [45]	12	Young's Internet Addiction Test [23]
Facebook Addiction Scale [49]	11	Not reported
Facebook Addiction Symptoms Scale [19]	15	Young's Internet Addiction Scale [23]
Social Networking Dependency and Addiction Scale [85]	31	Internet-Related Problem Scale [86] and Pathological Internet Use Scale [87]

Pallesen [12•, 40] have previously provided practical suggestions on how to differentiate between specific and general SNSs in terms of assessment.

Explanations of SNS Addiction

SNS addiction is likely to be fostered by an integration of dispositional, sociocultural, and reinforcing behavioral factors [12•, 14••, 18].

Dispositional Factors

Neurobiological explanations and studies of SNS addiction are currently lacking, although neurobiology is often addressed when explaining other behavioral and chemical addictions [41]. Addictive behaviors are often successfully treated via pharmacotherapy that targets the brain's reward system, which underpins neurobiological explanations [42••, 43]. Neuroimaging studies of Internet and gaming addicts support these explanations even further [44••]. Thus, based on findings from research conducted on other behavioral and substance addictions, it is possible that SNS addicts are biologically disposed to develop their excessive and compulsive social networking behavior.

The relationship between *personality factors* and SNS addiction has been well established in prior research [3•, 13••, 32, 45]. Studies are often based on the five-factor model of personality emphasizing the following main dimensions: neuroticism, extroversion, openness to experience, agreeableness, and conscientiousness [46]. Moderate levels of these factors are thought of as adaptable, and extreme versions as counterproductive [3•]. *Neuroticism* is manifested by the tendency to experience unpleasant emotions (anxiety, depression, fear). Research shows that this trait is positively correlated with SNS addiction [3•, 13••]. Extroversion (outgoing, social) has also often been associated with SNS addicts [3•, 13••, 32]. *Conscientiousness* is marked by being self-disciplined and aiming for achievement, consequently low scores has been linked to SNS addiction [3•, 13••, 32]. In line with this, a recent survey in a large occupational sample found that extraversion and neuroticism were positively and conscientiousness negatively related to private SNS usage during working hours [1•]. Furthermore, *impulsivity* and *narcissism* are other personality traits manifested by the tendency to act on impulse and grandiose ego, respectively. Both traits have been associated with SNS addiction [21, 47].

Studies have also suggested a link between *innate basic psychological needs* and SNS addiction [22, 27, 48, 49]. According to self-determination theory, the universal needs for autonomy, competence, and relatedness are the basis for all human motivation [50]. The *need for competence* refers to the need for control and mastery (having the SNS profiles well in hand). The *need for autonomy* refers to the need to be in charge of and in harmony with one's own life and self (having options and making one's own choices at SNSs without interference from parents or editors). The *need for relatedness* refers to the need for interpersonal interaction, connectedness, care, and to be cared for by others (huge friend-list). Research

shows that SNS addiction is related to need of belongingness [48], social contact [51], and feeling lonely [22] and reducing loneliness [52, 53]. Thus, if needs are distorted, action is taken to feed the need into balance (eventually leading to compulsive SNS behavior).

Basic cognitions also seem to play a role in fostering SNS addiction, including core beliefs, attributions, schemata, expectations, and automatic thoughts [12•]. Cognitions activate behavior [54], and may therefore activate social networking behavior. Thus, a negative self-concept ("I'm not good enough" or "I lack social skills") may trigger social networking behavior in cases where the person believes number of "likes" and "followers" on a SNS equals success, and leads to compulsive social networking. This theory is supported by studies where SNS addiction is empirically linked to low self-esteem [32, 45].

Sociocultural Factors

SNS addiction has also been explained from a *sociocultural perspective*. For example, the SNS addict may be influenced by certain family dynamics (e.g., parental pressure) or by observing obsessive social networking behavior of near or peripheral role models, such as parents, siblings, peers, or others [55]. In a macro perspective, our zeitgeist emphasizes social online and offline skills, competence, competition, availability, status, fame and fortune. These may act as important factors in the cultivation of SNS addiction—as they serve as personal and cultural symbols of attractiveness (e.g., evolutionary psychology). Cross-cultural studies would be an asset in future research, in order to investigate these relationships further [56]. Use of SNS also fosters social comparison (e.g., number of friends) [57] as well as impression management (presenting a glorified façade on SNSs) [58, 59] and are thus sociocultural factors contributing to the addiction.

Behavioral Reinforcement Factors

SNS addiction may also be explained on the basis of *learning* theories [12•]. If excessive social networking behavior has been rewarded in the past, the behavior is likely to repeat itself [60]. Positive outcomes such as entertainment, popularity, and attention and positive feedback from significant others may thus foster the behavior. Likewise, if social networking behavior has previously led to avoidance of negative consequences (e.g., boredom, criticism, group exclusion), it is more likely to occur again. Studies show that SNS addiction is related to motives of passing time, entertainment, fear of missing out, etc. [16••, 49, 61]. In addition to the principles of *operant conditioning*, principles of *social learning* and *model learning* (see above), are also applicable in understanding the development of the SNS addiction phenomenon in a behavioral reinforcement perspective [55]—but has yet to be empirically tested.

Last but not least, structural attributes inherent in the social networks themselves such as "likes" button, instant feedback and comments, in- and out-groups, picture posting, etc. most likely reinforce the behavior even further [14••]. SNS users seek feedback, and they get it from hundreds of people—instantly. It could be argued that the platforms are designed to get users "hooked".

Negative Consequences of SNS Addiction

In spite of any temporary and immediate gratifying effects derived from social networking, long-term excessive and compulsive social networking are seldom beneficial and is by definition unhealthy [11, 12•, 14••]. Regarding outcome research, identified correlates suggest that SNS addicts suffer from emotional, relational, health related, and performance problems [16••].

Emotional Problems

SNS addiction may create significant emotional problems. As with other addictions, the person often becomes addicted to the behavior as a relief from negative feelings of discomfort and stress (escape/control mechanism) [14••, 52, 62]. In short, SNS addicts engage in social networking to gain control, but become controlled by their social networks. SNS addicts may also use social networking as a means by which to stay disconnected from their own feelings [27]. Thus, SNS addicts are unable to detach themselves from SNSs despite realizing their destructive impact, and might experience anxiety if they stop social networking. SNS addicts may describe a positive energy they obtain from social networking, sometimes mistaking it for engagement because they associate it with feeling good. However, they do not feel good about a hobby or a social event—unless it involves online social networking [26]. It is in fact "real life" that does not feel good. Recent studies reported a link between SNS addiction and depression and anxiety [27, 45], whereas others reported poor self-esteem and well-being [32, 45, 63].

Relational Problems

Offline relations suffer [64] as SNS addicts become preoccupied with and devote most of their time to social networking [26, 65]. Others stop expecting time from them, and they become socially withdrawn, left with a troubled personal life. The emotional discomfort related to lying or covering up excessive amounts of social networking can also drive SNS addicts to isolate themselves from their environments [26]. In the wake of this social networking behavior, the SNS addict may

further experience significant distress, anxiety, and symptoms of depression [62], which again may negatively influence relationships at home (family conflicts), at work/school (impaired concentration and collaboration), and socially (loss of friends). In short, SNS addicts display extreme devotion to social networking to the detriment of interpersonal relationships [14••]. For example, one study found that excessive online networking was positively related to relationship dissatisfaction through jealousy and surveillance behaviors from the partner [65]. Another study reported social dysfunction as a correlate [27] and it has further been reported that Facebook addiction scores correlated significantly with a range of potential relational problems [26].

Health-Related Problems

Excessive online social networking may induce *sleep difficulties* [66, 67]. As expected, there are studies that show that SNS addicts report more sleep problems and poorer sleep quality compared to non-SNS addicts [13••, 20]. As "more is better" for SNS addicts, they stay on social networking even when it is not in their best interests, resulting in too little exercise, rest, and recovery. Hence, studies have reported associations between SNS addiction and insomnia and somatic symptoms [13••, 27]. From sleep research we know that such problems are related to psychological and physiological impairment over time [68–70]. Overall, longitudinal studies will be a great asset to explore if and how SNS addiction is related to health-related symptoms in the long run.

Performance Problems

As SNS addicts may spend more time and put more effort into their online social networks, and forego other activities, one would expect them to perform less in other domains. Obviously, these behaviors may influence their own and others' work and academic performance negatively. A case study of a SNS addict reported loss of job due to the social networking behavior [71]. In line with this, a recent study of 10,018 employees concluded that the use of social network sites for personal purposes during working hours impairs self-reported work performance [72]. Recently, studies have also closely examined the relationship between academic achievement and excessive SNS use and addiction. These studies report lower grades and poorer performance due to such digital distractions [26, 27, 73]. Thus, although a firm conclusion is premature, one can speculate that the SNS behavior negatively influences efficiency and achievements. The aforementioned emotional, relational, and health-related problems resulting from SNS addiction may also affect work and academic performance unfavorably. However, since use of the Internet is more or less inseparable from the professional and personal lives for most of us, interventions against SNS addiction must focus on controlled use rather than total abstinence of online social networking behavior [74].

Therapeutic Interventions for SNS Addiction

Left untended, all addictions including SNS addiction have unfortunate outfalls for most individuals. Still, well-documented therapeutic interventions, if any, for this type of addiction are difficult to come by. However, self-help strategies, therapies, and preventions proven effective for other addictive behaviors may work well also when approaching SNS addiction [12•, 14••, 75•].

Self-Help Interventions

Apps exist to help one cut down on time spent on social media and to eliminate digital distractions. By downloading such apps (*ColdTurkey, SelfControl, Freedom*) the SNS user can block the sites one like to avoid. It is also possible to install settings on SNSs that give time-fixed updates (e.g., every second hour). As people very often have excess to their social network sites via their smartphones, they can turn it off or set it on flight or silent mode when they do not wish to be disrupted. Other practical *self-help strategies* may pinpoint criteria such as not logging on to social network sites at work or school, leaving the smartphone at work or home, scheduling adequate breaks to visit social network sites, modifying thought patterns while social networking, setting limits and reasonable goals according to other obligations, and committing to offline activities etc. Relaxation techniques to better handle emotional discomfort may also come in handy (e.g., mindfulness) [76].

Therapeutic Interventions

Several studies of the treatment of other behavioral addictions have been based on *Cognitive-Behavioral Therapy* [12•]. Certain Cognitive-Behavioral Therapy techniques have also been recommended for treating Internet addiction [33, 77]. The approach involves exploring mental processes, and focuses on how the addict perceives, remembers, thinks and speaks of, and solves problems. Dysfunctional cognitions about social networking and the force that results from them are thus zeroed in on and reconstructed. Hence, alternative thoughts and strategies are established to cope with emotional discomfort, demands, and detachment. A diary of Internet use is usually kept through therapy. Behavior management, for both online and offline behavior may be used based on techniques such as behavioral rehearsal, modeling, recovery, self-instruction, and acquiring new adaptive skills [12•].

Motivational Interviewing [78] is a well-documented and effective treatment for behavioral addictions. It is "a client-centered, semi-directive method of engaging intrinsic

motivation to change behavior by developing discrepancy between current and wanted state and exploring and resolving ambivalence within the client" [78] [p. 25]. The main goal is to help the client discover the negative sides of the behavior, and increase the internal motivation for change. For this purpose, certain basic principles (developing discrepancy), communication skills (reflections), and strategies (ambivalence exploration) are used. Eliciting and addressing change-talk (talk entailing reasons, needs, desires, and ability to change) is another goal of Motivational Interviewing, as this is assumed to facilitate the change process even more.

Pharmacological Interventions

Some research has indicated that certain medications (Bupropion, Escitalopram, Methylphenidate) are useful in treating video game addiction and Internet addiction [79–81]. A meta-analysis of 16 studies regarding Internet addiction treatment reported no particular difference between pharmacological and psychotherapeutic interventions [82•]. Only six of these effect studies were RCT-based (randomized control trial).

Other Interventions

Employers typically fear financial loss due to employees' cyberloafing [72]. Teachers and parents typically fear that children fall behind in their personal growth and development [83]. Implementation of interventions on organizational or school levels has also been proposed by scholars, with a focus on *norms* and *policies* that promote healthy rather than unhealthy online social networking, as well as ensuring satisfaction of employees' and students' basic needs by providing positive and engaging challenges [1•, 12•, 72]. New research of attitudes towards use and actual use of social network sites for personal purposes at work were related to work-related factors (fewer challenges and demands) among others [1•]. It was also found that accessibility of and policies prohibiting the personal use of such sites at the workplace seemingly serve their purposes.

As leaders, teachers, and parents serve as significant *role models,* both online and offline, they should lead by example. How they behave, along with the *reward system* they serve, is of crucial importance for toning down or intensifying excessive social networking among their employees, students, and children [60].

Conclusions

This paper offers a review of the SNS addiction field. Although SNS addiction has become an issue of concern, especially for young people, the empirical database is relatively sparse. Several self-report measures of SNS addiction (predominantly to Facebook) have been developed over the last few years. Most of these need further validation, and there is an ongoing specificity debate whether they assess addictions to specific social networks sites or addictions to such sites in general, or to specific behavior engaged in when interaction with these sites (social interaction, gaming, picture posting, etc.). SNS addiction is complex and is probably molded by biological, psychological, social, and cultural factors. So far, cross-sectional studies show that SNS addiction is related to emotional, relational, health, and performance problems—representing a banner of individual and societal health. Unfortunately, there is little, if any, scientific research of methods documenting therapeutic interventions for SNS addiction. However, given the similarities with other behavioral and chemical addictions, effective interventions for these conditions may be adapted to the treatment of SNS addiction. Overall, this field is in great need of robust research including psychometric, cross-cultural, longitudinal, and treatment studies using objective behavioral parameters in representative samples.

Compliance with Ethics Guidelines

Conflict of Interest Cecilie Schou Andreassen declares no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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