

PROBLEMATIC INTERNET USE AND EMOTIONAL DYSREGULATION AMONG YOUNG PEOPLE:

A LITERATURE REVIEW

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**Objective:** In recent years scientific interest in Internet use disorders, especially among young people, has grown dramatically. Within this contemporary research field, difficulties in regulating emotions have been increasingly explored in association with problematic Internet use (PIU). Indeed, individuals who experience difficulties in emotion regulation might be more exposed to the risk of developing PIU. Therefore, the present study aimed to review the literature from the last ten years focused on the relationship between young people's emotional dysregulation and PIU, taking into account the main variables involved in this relationship and possible gender-related differences.

**Method:** This review included studies published between 2010 and 2020 that were indexed in major databases with the following keywords: emotion regulation, problematic Internet use, Internet addiction, social network addiction, and social media addiction. In the selection process of the studies, close attention was paid for the mean age of the involved samples that had to range between 13 and 25 years.

**Results:** A total of 23 studies satisfied the initial inclusion criteria and were included in the present literature review. Several reviewed studies found a strong association between emotion dysregulation and both PIU and problematic social networking with controversial gender-based findings. Furthermore, the relationships among emotional dysregulation, PIU, attachment styles, and metacognitions were largely explored.

**Conclusions:** Overall, the present review showed that problematic Internet use might represent a coping strategy to compensate for emotional regulation deficits. The lack of social support and the lack of a good parent-adolescent relationship seem to negatively affect emotional regulation abilities, which in turn increase the risk of developing PIU. Moreover, good metacognitive abilities might represent a protective factor towards emotional dysregulation and PIU. Finally, males with emotional dysregulation are likely to be more problematically engaged in Internet use than females. These results might have important practical implications to implement health prevention/promotion programs, emotion regulation-based training programmes and therapies.

**Key words:** internet addiction, problematic internet use, problematic social networking, emotion regulation, adolescence

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## 1. Introduction

In recent years scientific research into Internet use disorders has grown dramatically (Cash, Rae, Steel, & Winkler, 2012; Kuss & Lopez-Fernandez, 2016; Musetti et al., 2017; Pontes, Kuss, & Griffiths, 2015; Spada, 2014; Suissa, 2015). Nowadays, the excessive use of the Internet is widespread especially among adolescents and young adults (Boursier & Manna, 2018; Durkee et al., 2012; Musetti, Corsano, Boursier, & Schimmenti, 2020b; Tam, 2016), probably because they are typically more exposed to risky and addictive behaviors due to their active psychosocial and personality development (Moreno, Jelenchick, Cox, Young, & Christakis, 2011; Morrison & Gore, 2010; Stavropoulos et al., 2018; Mascheroni & Ólafsson, 2018).

Previous studies have described Internet addiction (IA) as being characterized by uncontrolled

preoccupations, urges, or behaviors related to computer use that might lead to impairment or distress, but also psychosocial maladjustment, academic difficulties, and physical health problems (Beard & Wolf, 2001; Shapira et al., 2003; Young, 1996). To date, diagnosis of IA is still a complex issue (Young, 2017) and it has not yet been classified as a clinical disorder in the Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association, 2013) due to its uncertain conceptual and operational definitions (e.g., Billieux, Schimmenti, Khazaal, Maurage, & Heeren, 2015; Gioia & Boursier, 2019b; Kuss & Lopez-Fernandez, 2016; Laconi, Rodgers, & Chabrol, 2014; Musetti & Corsano, 2018; Musetti et al., 2016; Rumpf, Brandt, & Demetrovics, 2019; Spada, 2014; Starcevic & Aboujaoude, 2017; van den Eijnden, Lemmens, & Valkenburg, 2016). Indeed, only the Internet Gaming Disorder has been included in Section

III of DSM-5 as an emerging condition that requires further evidence and clinical research (American Psychiatric Association, 2013). In this regard, within the scientific debate concerning the validity of the term “Internet addiction”, some researchers have highlighted that using the addiction framework to conceptualize excessive Internet use might lead to overpathologizing several everyday life activities (Billieux et al., 2015; Kardefelt-Winther, 2014; Kardefelt-Winther et al., 2017). Accordingly, some authors have preferred to adopt the construct “problematic Internet use” (Davis, 2001) because it does not characterize excessive Internet use as pathological behavior, nonetheless recognizing the compulsivity and negative outcomes underlying IA (Caplan, 2002, Lee, Ho, & Lwin, 2017; Yellowlees & Marks, 2007).

Within this contemporary research field, several psychopathological factors have been found to be associated with the problematic Internet use, such as social anxiety disorders (Vadher et al., 2019), depression (Musetti, Terrone, & Schimmenti, 2018; Wartberg et al., 2016), attention-deficit/hyperactivity disorder, symptoms of sleep disturbance (Starcevic & Khazaal 2017), dysfunctional parent-adolescent relationship (Chen, Li, Bao, Yan, & Zhou, 2015; D’Arienzo, Boursier, Griffiths, 2019; Schimmenti, Passanisi, Gervasi, Manzella, & Famà, 2014), and problematic behaviors such as alcohol use (Ko et al., 2008). Moreover, other factors have been detected, such as lower social support (Mazzoni, Baiocco, Cannata, & Dimas, 2016; Wartberg, Kriston, Bröning, Kegel, & Thomasius, 2017; Wu et al., 2016), maladaptive personality features (Schimmenti et al., 2019) lower effortful control (Cerutti et al., 2017; Li, Zhou, Li, & Zhou, 2016; Pace, Schimmenti, Zappulla, & Di Maggio, 2013), poorer physical and mental health (Cao, Sun, Wan, Hao, & Tao, 2011; Taylor, Pattara-Angkoon, Sirirat, & Woods, 2017; Young, 1999), alexithymia (Craparo, 2011; Mahapatra, & Sharma, 2018; Schimmenti et al., 2017), and the closely connected difficulties in emotion regulation (Caplan, 2002, 2010; Gámez-Guadix, 2014; Tokunaga, 2015).

In recent years, emotional dysregulation has been often explored because of its potentially unifying and transdiagnostic function of several psychopathological evidence (D’Agostino, Covanti, Monti & Starcevic, 2017; Dimaggio et al., 2017; Gross & Jazaieri, 2014). Emotional regulation has been typically defined as the individuals’ ability to sustain, intensify, or inhibit, consciously or unconsciously, the behavioral, cognitive, experiential, or physiological aspects of emotional arousal, in accordance with one’s own and socially acceptable desires and purposes (Gross & Thompson, 2007; Gergely, Fonagy, Jurist & Target, 2002). Previous studies highlighted that difficulties in emotional regulation were associated with the dysfunctional parent-child relationship (Bowlby, 1982; Thompson, 1994; Cassidy, 1994; Cabral, Matos, Beyers, & Soenens, 2012; Karreman & Vingerhoets, 2012) and the increased risk of developing or maintaining chemical addictions (such as smoking, alcohol or drug use) (Bonn-Miller, Vujanovic, Boden, & Gross, 2011; Fox et al., 2007, 2008) and behavioral addictions (such as risky sexual behaviors and gambling) (Blaszczynski & McConaghy, 1989; Getty, Watson, & Frisch, 2000; Messman-Moore, Walsh, & DiLillo, 2010; Tull, Weiss, Adams, & Gratz, 2012; Williams & Grisham, 2012). According to Wurmser (1974), as in a self-treatment attempt, emotionally dysregulated individuals were likely engaged in addictive behaviors in an attempt to escape from or minimize negative moods and alleviate

emotional distress (Musetti et al., 2019, 2020a; Schreiber, Grant, & Odlaug, 2012). In this regard, problematic Internet use has been considered a possible attempt to cope with unpleasant feelings by escaping into an online life (Caplan, 2002, 2010; Gámez-Guadix, 2014; Kim et al., 2017; Tokunaga, 2015). Some studies focused on problematic Internet use as a coping strategy aiming at temporarily compensating for concurrent or past psychological problems, facing daily life issues, or alleviating dysphoric moods (Young, 1998; Kardefelt-Winther, 2014; Schimmenti & Caretti, 2010, 2017; Schimmenti, Guglielmucci, Barbasio, & Granieri, 2012). Accordingly, a previous Taiwanese study had found that highly Internet addicted individuals were more likely to regulate their emotion by suppression and escape via problematic Internet use (Fung, 2002). More recent studies have confirmed significant associations among Internet use to manage emotions, difficulties in Internet- use regulation, and Internet use-related negative outcomes (Caplan, 2002, 2010; Di Blasi et al., 2019; Gámez-Guadix, 2014; Gervasi et al., 2017; Marino, Gini, Angelini, Vieno, & Spada, 2020; Maganuco, Costanzo, Midolo, Santoro, & Schimmenti, 2019; Musetti et al., 2018, 2020b; Schimmenti, Starcevic, Gervasi, Deleuze, & Billieux, 2018; Tokunaga, 2015).

As concerns potential gender-related differences dealing with problematic Internet use and emotional dysregulation, few studies have shown controversial results. As concerns Internet use, male adolescents were generally more problematic users than female adolescents (Choi et al., 2009; Chou, Condon, & Belland, 2005; Hawi, 2012; Durkee et al., 2012). Moreover, males and females’ motives for Internet use differed. Indeed, while females were more engaged in the Internet for social and communication activities or educational purposes (Dufour et al., 2016; Kimbrough, Guadagno, Muscanell, & Dill, 2013; Mihara et al., 2016), males were more likely to prefer online videogaming, viewing pornographic sites, file downloading, and indiscriminate surfing (Chen & Fu, 2009; Dufour et al., 2016; Munno, Saroldi, Bechon, Sterpone, & Zullo, 2016). As concerns emotional regulation abilities, males tended to display their emotional arousal in a more physical way, whereas females tended to display their emotional arousal more expressively, talking out their feelings and using emotion-focused coping strategies (Block, 1973; Matud, 2004). Moreover, despite conflicting findings (Gioia & Boursier, 2019a), males typically reported higher levels of emotional dysregulation than females, who in turn seem to display greater emotional awareness, use more emotion-related language to describe emotional experiences, and use a more extensive range of emotional regulation (Barrett, Lane, Sechrest, & Schwartz, 2000; Nolen-Hoeksema, 2012; Nolen-Hoeksema & Aldao, 2011).

In summary, previous studies had highlighted that problematic Internet use might be used as a coping strategy for temporarily compensating or alleviating dysphoric moods and negative emotions (Young, 1998; Kardefelt-Winther, 2014). Individuals who experience difficulties in emotion regulation appeared more exposed to the risk of developing problematic Internet use because online activities might represent a useful alternative means to manage the lack of emotional regulation strategies (Fung, 2002; Caplan, 2002, 2010; Gámez-Guadix, 2014; Tokunaga, 2015), especially among younger Internet users. Indeed, during the transition from adolescence to adulthood, individuals are more likely to engage in addictive behaviors (Boursier, Gioia, Griffiths, 2020a; Englund,

Saroldi, Bechon, Sterpone, & Zullo, 2013; Munno et al., 2016) and it appears essential to systematically explore the relationship between difficulties in emotion regulation and problematic Internet use (Casale, Caplan, & Fioravanti, 2016; Schimmenti et al., 2017). Therefore, the present study attempted to review the scientific studies published in the last ten years focused on the relationship between adolescents' (aged between 13 and 19 years) and young adults' (aged between 20 and 25 years) emotion dysregulation and problematic Internet use. Moreover, since the proven association between these dimensions does not sufficiently clarify the underlined psychological mechanisms that promote problematic Internet use among individuals with deficits in emotion regulation, the present review proposed to take into account the variables implicated in this relationship. Finally, gender-related differences in the relation between variables have been evaluated.

## 2. Method

A systematic review was conducted between December 2019 and March 2020, using *Web of Science*, *Scopus*, *PubMed* and *PsycINFO* as the main research databases and entering the following keywords: emotion regulation\*, problematic Internet use\*, Internet addiction\*, social network addiction\*, and social media addiction\*. Inclusion criteria for the present review were the following: (i) studies published in the past ten years, from 2010 to 2020, (ii) full-text studies published in English and Italian, (iii) studies with quantitative empirical data, (iv) studies with at least 150 participants, and (v) studies in which the mean age of the individuals was between 13 years old and 25 years old. Excluded from the review were: (i) studies containing scale validations, dissertations, conference proceedings, and reviews, (ii) studies in which Internet or social media addictions were not explored, and (iii) studies in which a specific instrument to assess emotional dysregulation was not used.

## 3. Results

A total of 252 papers were initially identified. Duplicate articles resulted in a total of 62. Subsequently, 167 papers were excluded because they did not meet the inclusion criteria. Thus, 23 studies that met the initial inclusion criteria were included in the present literature review. Concerning the diagnostic instruments used to assess problematic Internet use (**table 1**), the Internet Addiction Test (IAT; Young, 1998) was the most used (Akbari, 2017; Amendola, Spensieri, & Guidetti, 2019; Evren et al., 2018, 2019; Hormes, Kearns, & Timko, 2014; Karaer & Akdemir, 2019; Wang et al., 2018; Yildiz, 2017; Yorulmaz, Civgin, & Yorulmaz, 2020; Yu, Kim, & Hay, 2013). Ceyhan et al. (2019) tested the IAT in association with the Chen Internet Addiction Scale (CIAS; Chen, Weng, Su, Wu & Yang, 2003), whereas Mo et al. (2018) used only the CIAS. Moreover, two studies utilised the Generalized Problematic Internet Use Scale 2 (GPIUS2; Caplan, 2010) (Andangsari, Dhowi, Djunaidi, Fitriani, & Harding, 2017; Casale et al., 2016) and Pontes et al. (2018) used the GPIUS2 Preference for Online Social Interactions subscale and the Bergen Social Media Addiction Scale (BSMAS; Andreassen et al., 2016). Finally, two studies tested the Compulsive Internet Use Scale (CIUS; Meerkerk, Van Den Eijnden, Vermulst, & Garretsen, 2009) (Lindenberg, Halasy, & Schoenmakers, 2017; Wartberg & Lindenberg, 2020) and other studies tested problematic Internet use using

several different assessment tools (Liu & Ma, 2019; Estevez, Jauregui, Sanchez-Marcos, Lopez-Gonzalez, & Griffiths, 2017; Faghani, Akbari, Hasani, & Marino, 2020; Marino et al., 2019; Spada & Marino, 2017; Trumello, Babore, Candelori, Morelli, & Bianchi, 2018)

Concerning emotional dysregulation, the most employed self-report measure was the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) (Akbari, 2017; Amendola et al., 2019; Casale et al., 2016; Ceyhan et al., 2019; Estevez et al., 2017; Evren et al., 2018, 2019; Faghani et al., 2020; Hormes et al., 2014; Karaer & Akdemir, 2019; Liu & Ma, 2019; Marino et al., 2019; Mo et al., 2018; Pontes et al., 2018; Yorulmaz et al., 2020; Yu et al., 2013). Only two studies used the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) (Andangsari et al., 2017; Trumello et al., 2018), whereas the other studies employed other assessment tools of emotional dysregulation (Lindenberg et al., 2017; Spada & Marino, 2017; Wang et al., 2018; Wartberg & Lindenberg, 2020; Yildiz, 2017).

### 3.1. Emotional dysregulation and problematic Internet use

Several reviewed studies found a strong association between emotional dysregulation and problematic Internet use (Akbari et al., 2017; Amendola et al., 2019; Casale et al., 2016; Ceyhan et al., 2019; Estevez et al., 2017; Evren et al., 2018, 2019; Karaer & Akdemir, 2019; Mo et al., 2018; Spada & Marino, 2017; Trumello et al., 2018; Wang et al., 2018; Yildiz, 2017; Yorulmaz et al., 2020; Yu et al., 2013) among both adolescents and young adults, showing that the emotional dysregulation might lead to symptoms of problematic Internet use compared to negative emotionality (Casale et al., 2016). According to Karaer and Akdemir (2019), adolescents with problematic Internet use reported more difficulty in identifying and describing emotions, understanding emotional reactions, controlling their impulsive behaviors in response to negative emotional experiences, and lower ability to use effective emotion regulation strategies than peers without problematic Internet use. More specifically, three specific dimensions of the Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004) corresponding to difficulty in accessing to emotion regulation strategies, the difficulty in adopting goal-oriented behaviors when experiencing negative emotions, and the lack of emotional clarity have been identified as significant predictors of problematic Internet use in both adolescents (Amendola et al., 2019) and young adults (Ceyhan et al., 2019). Interestingly, the Wartberg and Lindenberg's (2020) longitudinal study highlighted that spontaneous remission of teenagers' problematic Internet use within 12 months was strongly predicted by less enhanced maladaptive emotion regulation strategies. Furthermore, emotion dysregulation was found in association with young adults' problematic social networking sites (SNSs) use (Hormes et al., 2014; Pontes et al., 2018; Marino et al., 2019; Liu & Ma, 2019). As Hormes et al. (2014) pointed out, problematic SNSs users showed higher emotional regulation problems, including more experiential avoidance, lack of acceptance of emotional responses, limited access to emotion regulation strategies, poor impulse control, and difficulties in goal-directed behaviors than non-problematic users, suggesting that problematic SNSs use might be sustained via negative reinforcement.

**Table 1.** Summary of the 23 studies reviewed

Author/year	N participants/ mean age	Country	Instrument to assess problematic internet use	Instrument to assess emotional dysregulation	Main findings
Akbari et al., 2017	413 (mean age 20.13 years)	Iran	Internet Addiction Test (IAT; Young, 1998)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	There are significant correlations between PIU, emotional dysregulation and metacognitions. Emotional dysregulation has an indirect effect via metacognition on PIU.
Amendola et al., 2019	280 (aged 11-18 years)	Italy	Internet Addiction Test (IAT; Young, 1998)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	Emotion dysregulation was significantly associated with problematic internet use.
Andangsari et al., 2017	274 (mean age 18.83 years)	Indonesia	Generalized Problematic Internet Use Scale 2 (GPIUS2; Caplan, 2010)	Emotion Regulation Questionnaire (ERQ; Gross & John, 2003)	Females have higher score in PIU than males. Female students used social media more than males and have more chance to get PIU.
Casale et al., 2016	293 (mean age 21.73 years)	Italy	Generalized Problematic Internet Use Scale 2 (GPIUS2; Caplan, 2010)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	Positive metacognitions partially mediated the effect of emotional dysregulation on PIU.
Ceyhan et al., 2019	754 (aged 17-50 years; mean age 20.82 years)	Turkey	Chen Internet Addiction Scale (CIAS; Chen et al., 2003)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	Fearful and preoccupied attachment were significantly associated with pathological Internet use. Being male and difficulties in emotional regulation significantly contributed to the risk for development of Internet addiction.
Estevez et al., 2017	472 (aged 13-21 years; mean age 15.6 years)	Spain	Internet Addiction Test (IAT; Young, 1998)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	Emotion regulation and attachment predicted PIU. Females scored significantly higher in maternal and peer attachment.
Evren et al., 2019	920 (mean age 22 years)	Turkey	Internet Addiction Test (IAT; Young, 1998)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	Individuals with Internet or SNSs addiction were more likely to report problems with emotion regulation.
Evren et al., 2018	1010 (mean age 21 years)	Turkey	Internet Addiction Test (IAT; Young, 1998)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	Young adults with internet addiction were more likely to report problems with emotion regulation.
Faghani et al., 2020	300 (mean age 20.27 years)	Iran	Internet Abusive Use Questionnaire (IAUQ; Calvo-Francés, 2016)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	Experiential avoidance and desire thinking fully mediated the relationship between difficulties in emotion regulation and PIU.
Hormes et al., 2014	253 (mean age 19.68 years)	USA	Internet Addiction Test (IAT; Young, 1998)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	Disordered online social networking was significantly and positively associated with greater difficulties in emotion regulation.
Karaer et al., 2019	176 (aged 12-17 years; mean age 15.4 years)	Turkey	Internet Addiction Test (IAT; Young, 1998)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	The adolescents with IA have less perceived social support and greater difficulties in emotion regulation. Lower parental strictness/supervision was a significant predictor of IA.
Lindenberg et al., 2017	340 (aged 12-18 years)	Germany	Compulsive Internet Use Scale (CIUS; Meerkerk et al., 2009)	German Questionnaire for Assessment of Emotion Regulation in Children and Adolescents (FEEL-K; Grob & Smolenski, 2005)	PROTECT promoted coping mechanisms as more functional alternatives to excessive Internet use by training problem solving skills and emotion regulation strategies.
Liu & Ma, 2019;	463 (mean age 19.94 years)	China	Chinese Social Media Addiction Scale (Liu & Ma, 2019;)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	Attachment anxiety positively predicted SNSs addiction and emotion regulation mediated this relationship.
Marino et al., 2019	750 (aged 18-61 years; mean age 23.38 years)	Italy	Problematic Facebook Use Scale (PFUS; Marino et al., 2017)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	Difficulties in emotion regulation and desire thinking predicted problematic Facebook use.

Table 1. Continued

Mo et al., 2018	862 (aged 10-17 years; mean age 12.53 years)	China	Chen Internet Addiction Scale (CIAS; Chen et al., 2003)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	Social support was negatively related to emotion dysregulation and Internet usage, which in turn, were positively related to Internet addiction. The relationship between social support and emotion dysregulation, Internet usage, and Internet addiction, and those between emotion dysregulation and Internet addiction and between Internet usage and Internet addiction were stronger among female participants.
Pontes et al., 2018	511 (aged 16 – 35 years)	UK	Bergen Social Media Addiction Scale (BSMAS; Andreassen et al., 2016) Preference for Online Social Interaction, a subscale from the Generalized Problematic Internet Use Scale 2 (GPIUS2; Caplan, 2010)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	SNSs addiction was strongly associated with dysfunctional emotion regulation, preference for online social interactions, and maladaptive cognitions.
Spada & Marino, 2017	380 (aged 13-20 years; mean age 15.82 years)	Italy	Short Problematic Internet Use Test (SPIUT; Siciliano et al., 2015)	Social and Emotion Health Survey (SEHS; Furlong et al., 2014)	Metacognitions and emotion regulation have direct effects (positive and negative respectively) on PIU, while the relationship between metacognitions and emotion regulation was not significant.
Trumello et al., 2018	743 (aged 10-21 years; mean age 15.64 years)	Italy	Shorter PROMIS Questionnaire (SPQ; Christo et al., 2003)	Emotion Regulation Questionnaire (ERQ; Gross & John, 2003)	Emotion regulation strategy (cognitive reappraisal) and maternal emotional availability strongly predicted Internet addiction.
Wang et al., 2018	998 (aged 12-17 years; mean age 15.15 years)	China	Internet Addiction Test (IAT; Young, 1998)	Emotion Regulation Ability Scale (ERAS; Liu, 2011)	Good parent-adolescent relationship was positively associated with adolescent emotion regulation ability, which in turn was negatively associated with their IA.
Wartberg & Lindenberg, 2020	272 (mean age 15 years)	Germany	Compulsive Internet Use Scale (CIUS; Meerkerk et al., 2009)	German Questionnaire for Assessment of Emotion Regulation in Children and Adolescents (FEEL-K); Grob & Smolenski, 2005)	Lower level of maladaptive emotion regulation strategies predicted spontaneous remission of problematic Internet use.
Yildiz, 2017	262 (aged 14-19 years; mean age 16.57 years)	Turkey	Internet Addiction Test (IAT; Young, 1998)	The Regulation Emotions Questionnaire (REQ; Phillips & Power, 2007)	External-dysfunctional emotion regulation, internal-dysfunctional emotion regulation, and internal-functional emotion regulation significantly predicted IA.
Yorulmaz et al., 2020	400 (mean age 21.24 years)	Turkey	Internet Addiction Test (IAT; Young, 1998)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	As PIU increased, stress levels, psychological rigidity, and emotion regulation difficulties also rise. Emotion regulation was a significant predictor of PIU.
Yu et al., 2013	525 (mean age 15.33 years)	South Korea	Internet Addiction Test (IAT; Young, 1998)	Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	Difficulties in emotion regulation mediated the relationship between perceptions of their parents' behaviours and Internet use.

### 3.2. The role of attachment styles and social support between emotional dysregulation and problematic Internet use

Concerning the link between emotion regulation and the quality of parent-child relationships, Yu et al. (2013) pointed out that adolescents' negative perceptions of parental behaviors were significantly associated with emotion dysregulation. Specifically, adolescents who perceived their parents as rejecting, hostile, indifferent, and low warmth were more likely to exhibit greater emotion regulation difficulties. On the contrary, positive parental behaviors and interactions facilitated positive emotion regulation during adolescence. Moreover, according to Ceyhan et al. (2019), young adults with secure and avoidant attachment style reported higher emotional regulation ability than individuals with preoccupied and fearful attachment style.

About the relationship between attachment styles and problematic Internet use, some studies reported that poor attachment and lower parental strictness/supervision predicted adolescents' problematic Internet use (Estévez et al., 2017; Karaer & Akdemir, 2019) and Ceyhan et al. (2019) pointed out that a tendency to interpersonal avoidance seems to protect young adults against Internet use disorders. Accordingly, Liu & Ma (2019) revealed that attachment anxiety, but not attachment avoidance, positively predicted SNSs addiction among emerging adults. Furthermore, Karaer & Akdemir (2019) highlighted that teenagers with problematic Internet use perceived lower parents' emotional availability. Indeed, adolescents who experienced impaired emotional responsiveness, inadequate family care and attention, improper supervision and monitoring, and limited access to open communication were more likely engaged in problematic Internet use. Similarly, Trumello et al. (2018) revealed that maternal emotional availability, but not paternal emotional availability, predicted problematic Internet use among adolescents and that lower levels of emotional quality in the maternal relationship were associated with higher levels of problematic Internet use, highlighting the pivotal role of the understudied construct of parental emotional availability.

Some reviewed studies specifically focused on the relationship among attachment styles, emotion dysregulation, and problematic Internet use. In particular, Yu et al. (2013) and Wang et al. (2018) showed that the emotion regulation ability mediated the relation between the quality of the parent-child relationship and adolescents' problematic Internet use, highlighting that good parent-adolescent relationship contributes to the development of emotion regulation ability which in turn might lead to a reduction in adolescents' problematic Internet use. Furthermore, Liu & Ma (2019) highlighted that attachment anxiety predicts emotional regulation difficulty, which in turn predicts SNS addiction, confirming the mediating effect of emotional regulation difficulty on the relationship between attachment anxiety and SNS addiction among young adults. Finally, Mo et al. (2018) found that adolescents' perception of social support was associated with a lower level of emotion dysregulation, which in turn was associated with a lower level of problematic Internet use. Similarly, Karaer & Akdemir (2019) highlighted that teenagers with problematic Internet use perceived lower social support, especially from their friends.

### 3.3. The role of cognitive and metacognitive factors between emotional dysregulation and problematic Internet use

Some reviewed studies explored the link among cognitive and metacognitive factors, emotion dysregulation, and problematic Internet use aiming at clarifying the psychological mechanisms that lead individuals with emotion dysregulation to engage in problematic Internet use. In this regard, Spada and Marino (2017) did not confirm the relationship between emotion regulation and metacognitions in adolescent samples. On the contrary, other studies highlighted a significant link between emerging adults' emotion regulation and metacognitions (Akbari, 2017; Casale et al., 2016). Specifically, Casale et al. (2016) conceptualized positive metacognitions as a specific form of expectancy relating to a behavior as a means cognitive-emotional regulation (e.g., "using alcohol will help me control my thoughts" or "gambling will clear my mind") and clearly revealed the mediating role of specific positive metacognitions in the relationship between emotional dysregulation and problematic Internet use. In particular, two specific positive metacognitions about Internet use, corresponding to "escapism" and "controllability", mediated the association between emotional regulation problems and problematic Internet use. In addition, the study of Akbari (2017) confirmed that difficulties in emotion regulation had both a direct and indirect effect on problematic Internet use via metacognitions and distress tolerance among young adults.

In another perspective, according to previous studies (Caselli & Spada, 2011; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996), Faghani et al. (2020) showed that cognitive variables as "experiential avoidance" (a self-regulatory strategy involving efforts to control or escape from negative stimuli that might generate suffering and discomfort) and "desire thinking" (a cognitive voluntary elaboration of the desired activity through verbal perseveration and imaginal prefiguration) played a mediating role in the relationship between difficulties in emotion regulation and problematic Internet use among young adults. Similarly, Marino et al. (2019) confirmed the role of desire thinking, while Pontes et al. (2018) the role of maladaptive cognitions, in predicting emerging adults' problematic SNSs use.

### 3.4. The role of gender differences between problematic Internet use and emotional dysregulation

Among the reviewed studies, some gender-related differences emerged in the relationship between emotion dysregulation and problematic Internet use, showing contrasting results. Yu et al. (2013) and Ceyhan et al. (2019) observed that both male adolescents and young adults were more likely to report problematic Internet use than female adolescents, while, on the contrary, Andangsari et al. (2017) highlighted that female adolescents used social media more than males and have a greater likelihood of becoming problematic Internet users than their male peers. Moreover, Wartberg and Lindenbergh (2020) found that male gender predicted spontaneous remission of problematic Internet use more than female gender in adolescence.

According to Liu & Ma (2019) and Yu et al. (2013), male adolescents and young adults were considered to exhibit higher levels of emotional dysregulation than females, while, in contrast with these results, Mo et al.

(2018) claimed that female teenagers have higher levels of emotional dysregulation than males. Specifically, male adolescents showed greater difficulties in paying attention and recognizing emotions (Estevez et al., 2017), accepting their emotional responses, controlling impulses and accessing to emotional regulation strategies (Yu et al., 2013). Instead, female adolescents showed greater difficulties in clearly distinguishing their feelings and performing a task when they experience negative emotions (Estevez et al., 2017). Furthermore, Yu et al. (2013) highlighted a positive and significant correlation between male adolescents' non-acceptance of emotional responses and lack of emotional clarity and problematic Internet use. Finally, as afore-mentioned, the perceived social support facilitated emotion regulation and reduced problematic Internet use, especially among female teenagers (Mo et al., 2018).

#### 4. Discussion

The present study reviewed the studies published in the last ten years exploring the relationship between young people's emotional dysregulation, problematic Internet use, and other variables potentially implicated in this relationship. As many previous studies have suggested (Caplan, 2002, 2010; Fung, 2002; Gámez-Guadix et al., 2014; Kardefelt-Winther, 2014; Musetti et al., 2018; Schimmenti & Caretti, 2010, 2017; Schimmenti et al., 2012, 2017; Scimeca et al. 2014; Tokunaga, 2015; Young, 1998), difficulties with emotion understanding and managing are closely related to problematic Internet use. Similarly, several reviewed studies observed a significant association between emotional dysregulation and problematic Internet use among both adolescents and young adults (e.g., Akbari et al., 2017; Amendola et al., 2019; Casale et al., 2016), highlighting that emotional dysregulation might more powerfully lead to symptoms of problematic Internet use compared to negative emotional states (Casale et al., 2016), and that lower level of maladaptive emotion regulation strategies predicted spontaneous remission of adolescents' problematic Internet use (Wartberg & Lindenberg, 2020). Other studies showed a specific significant association between young adults' emotion dysregulation and problematic social networking (Liu & Ma, 2019; Hormes et al., 2014; Marino et al., 2019; Pontes et al., 2018). Therefore, the reviewed findings have confirmed that problematic Internet-based activities might serve as a maladaptive coping strategy for individuals with difficulties in emotion regulation, by helping them to distract from negative emotions, escape from reality, or regulate feelings of loneliness, depression, anxiety and stress, despite other possible negative consequences and the increasing likelihood of being problematically engaged in Internet use (Spada & Marino, 2017; Mo et al., 2018). Furthermore, the abilities in emotion regulation have been largely linked to experiences with caregivers during childhood and attachment styles (Musetti et al., 2018; Schimmenti, 2016), which in turn appeared strictly related to problematic Internet and SNS use (D'Arienzo et al., 2019). Accordingly, some reviewed studies described the emotion regulation ability as a significant mediator in the relation between the quality of the parent-adolescent relationship and problematic Internet use (Yu et al., 2013; Wang et al., 2018) and between the quality of the parent-young adult relationship and problematic SNSs use (Liu & Ma, 2019). In this regard, the emotion regulation ability might explain why a good relationship with parents reduces adolescents' problematic Internet

use (Estevez et al., 2017; Karaer & Akdemir, 2019; Trumello et al., 2018) and young adults' problematic SNS use (Liu & Ma, 2019). These findings are consistent with attachment theory and emotion socialization theory (Bowlby, 1982; Cassidy, 1994; Thompson, 1991), according to which destructive parent-child relationships prevent children from acquiring adaptive emotional adjustment skills, which in turn might increase the risk of problematic Internet use, especially during adolescence. However, in line with previous studies (Oldmeadow, Quinn, & Kowert, 2013; Worsley, McIntyre, Bentall, & Corcoran, 2018), Liu & Ma (2019) highlighted that only anxious attachment was associated with problematic SNSs use, assuming that emerging adults with an avoidant attachment style might find close Web-mediated relationships too distressing and online self-disclosure and warmth towards others too difficult. Among adolescents, emotion regulation was found to mediate also the link between the perception of social support from parents and friends and problematic Internet use (Mo et al., 2018). Likely, these supportive relationships represent an important resource in reducing problematic Internet use by facilitating adaptive regulations on emotions (Karaer & Akdemir, 2019; Mo et al., 2018). Although offline social support was reported as a pivotal health protective factor among adolescents, it has not been clarified yet whether it might be protective also for young adults and online social support might represent a risk factor for problematic Internet use (Wang & Wang, 2013).

Concerning the relationship between metacognitions and problematic Internet use, some studies highlighted that positive metacognitions (such as escapism and controllability) (Akbari, 2017; Casale et al., 2016) and cognitive factors (such as experiential avoidance and desire thinking) (Faghani et al., 2020) mediated the relationship between emotional dysregulation and problematic Internet use among young adults. These studies partially confirmed previous Spada et al.'s (2008) findings by which general metacognitions mediated the association between negative emotions and problematic Internet use. However, Spada et al. (2008) investigated the mediating role of general metacognitions in problematic Internet use only focusing on negative affective states without considering the individual's ability to regulate such states. Instead, according to Casale et al. (2016), when alternative and more adaptive emotional regulatory strategies are not available, individuals might turn to the Internet in order to escape from reality and get greater control over negative thoughts and feelings compared to real life situations. Furthermore, difficulties in emotion regulation might lead to problematic Internet use through experiential avoidance (Faghani et al., 2020), because Internet can provide individuals who have difficulty regulating their emotions with an accessible way to forget negative feelings. Moreover, individuals with high emotion dysregulation might engage in desire thinking (Faghani et al., 2020) in order to relieve emotional stress, by prefiguration and anticipating the pleasure and the desired consequences of using the Internet. Nevertheless, this significant link between emotion regulation and metacognitions was not confirmed in adolescent samples (Spada & Marino, 2017). Likely, as Bakracevic et al. (2010) pointed out, the perceived self-emotion-regulation skills tend to decrease from childhood to adolescence and, then, to increase again in adulthood, while metacognitive skills seem to increase across the group age. Accordingly, in line with the typical developmental processes of adolescence, younger individuals might tend to underestimate their emotional competencies regardless of their metacognitive abilities

(Bakracevic et al., 2010; Spada & Marino, 2017).

Other studies have also shown that stressful life events (Wang et al., 2018), distress tolerance (Akbari, 2017), and psychological flexibility (Yorulmaz et al., 2020) significantly mediated the relationship between emotion dysregulation and problematic Internet use. Inversely, Yorulmaz et al. (2020) observed that emotion dysregulation mediated the relationship between stressful life events and problematic Internet use. Moreover, Evren et al. (2019) highlighted that severity of dissociative experiences, together with emotion dysregulation, mediated the relationship between childhood trauma and problematic Internet use. These results require further investigation in future research.

Concerning possible gender-related differences, although controversial findings, most of the reviewed studies agreed on higher emotional dysregulation (Yu et al., 2013; Liu & Ma, 2019) and problematic Internet use (Yu et al., 2013; Ceyhan et al., 2019) among both male adolescents and young adults. As previous research had suggested (Musetti et al., 2018; Weiser, 2004), males are likely remain more engaged than females in Internet use for entertainment and leisure activities that might promote the problematic or addictive use of Internet applications. However, according to Wartberg and Lindenberg (2020), the probability of spontaneous remission is actually higher in male adolescents. Moreover, significant correlations between difficulties in emotional regulation and problematic Internet use were found only among the males (Yu et al., 2013). Accordingly, the previous Gioia & Boursier's (2019a) study showed that male gender significantly moderated the relationship between teenagers' emotional dysregulation and preference for online social interactions. In this regard, more likely female adolescents than male peers, might benefit in online and offline environments from the social support that represents a pivotal protective factor, facilitating emotional regulation and reducing problematic Internet use (Mo et al., 2018). Therefore, the influence of social support among female adolescents might explain why emotional dysregulation was correlated with problematic Internet use only among males (Yu et al., 2013) and, on the other end, why females with high emotional dysregulation did not prefer online social interactions (Gioia & Boursier, 2019a).

Finally, age might significantly affect the relationship between emotional dysregulation and problematic Internet use. More specifically, the adolescence triggers tremendous changes in adolescents' identity and body leading to increasing relevance of their disclosure in online environments (Boursier et al., 2020b, 2020c; Franchina & Lo Coco, 2018; Gioia, Griffiths, Boursier, 2020). Accordingly, teenagers are more likely to be exposed to a greater emotional dysregulation and to the risks of adopting dysfunctional addictive behaviors such as problematic Internet use (Gioia & Boursier, 2019a; Munno et al., 2016; Yu et al., 2013). Thus, good relationships with parents and friends might be important factors to prevent emotional dysregulation and consequently problematic Internet use, especially among adolescents (Estevez et al., 2017; Karaer & Akdemir, 2019; Trumello et al., 2018; Wang et al., 2018; Yu et al., 2013). Instead, metacognitive and cognitive factors might have a strong protective role in the relationship between emotional dysregulation and problematic Internet use, especially among emerging adults (Akbari et al., 2017; Casale et al., 2016; Faghani et al., 2020).

The results of the present review should be considered in view of the examined studies' limitations. Firstly, more longitudinal studies are needed to clarify the direction of relationships among the variables among

both adolescents and young adults. Secondly, studies largely used self-report methods to collect data, which might be influenced by recall bias, answer accuracy, and social desirability. Therefore, future researchers should consider data from multiple informants (e.g., mothers, fathers, teachers, adolescents) and quasi-quantitative methods in order to provide a more comprehensive view on the relationships between problematic Internet use and emotional dysregulation among young individuals. Furthermore, more studies are needed to test the mediating role of metacognitions in the relationship between emotional dysregulation and problematic Internet use, especially among adolescents and not only among young adults. Future studies should also avoid gender imbalance and explore specific Internet-related activities considering their differences among the wide range of Internet users' groups. Finally, future research should evaluate the link between emotional dysregulation and problematic Internet use in interactions with other variables, contributing to the research field concerning the protective and predictive factors of problematic Internet use. However, the specific limitations of the present review should be considered. Firstly, the problematic Internet use research field is extremely prolific and well explored and only studies published within the last ten years has been included in the present study. Thus, this review approach might have caused the exclusion of relevant studies published more than ten years ago. Secondly, due to the electronic search of the studies, some non-indexed papers in the involved databases might have been missed. Finally, the fifth inclusion criteria of the present study by which the mean age of the participants had to be included between 13 and 25 years did not ensure the exclusion of older individuals.

## 5. Conclusions

The present review showed that problematic Internet use might represent a coping strategy to compensate for emotional regulation deficits among both adolescents and young adults. The lack of social support, especially among male adolescents, and the lack of a relationship with parents negatively affect emotional regulation abilities, which in turn increase the adolescents and young adults' risk of developing problematic Internet use and the emerging adults' problematic social networking. Moreover, good metacognitive abilities might represent a protective factor towards young adults' emotional dysregulation and problematic Internet use. Finally, male adolescents with emotional dysregulation are likely to be more prone to problematic Internet use than females. This might be explained by the fact that female peers with emotional dysregulation can rely on social support as a protective factor against problematic Internet use more than males.

These results might have important practical implication to implement health prevention/promotion programs. Indeed, according to Lindenberg et al. (2017), problematic Internet use might be prevented by improving emotion regulation skills among adolescents and young adults. Accordingly, training programmes focused on emotion regulations have been included in several therapeutic approaches, such as emotion-focused therapy (Greenberg, 2014), acceptance- and mindfulness-based therapy (Allen, Bromley, Kuyken, & Sonnenberg, 2009), emotion regulation therapy (Aldao, & Nolen-Hoeksema, 2010), and dialectical behavior therapy (Pluhar, Jhe, Tsappis, Bicham, & Rich, 2020). Moreover, as functional parent-adolescent relationship

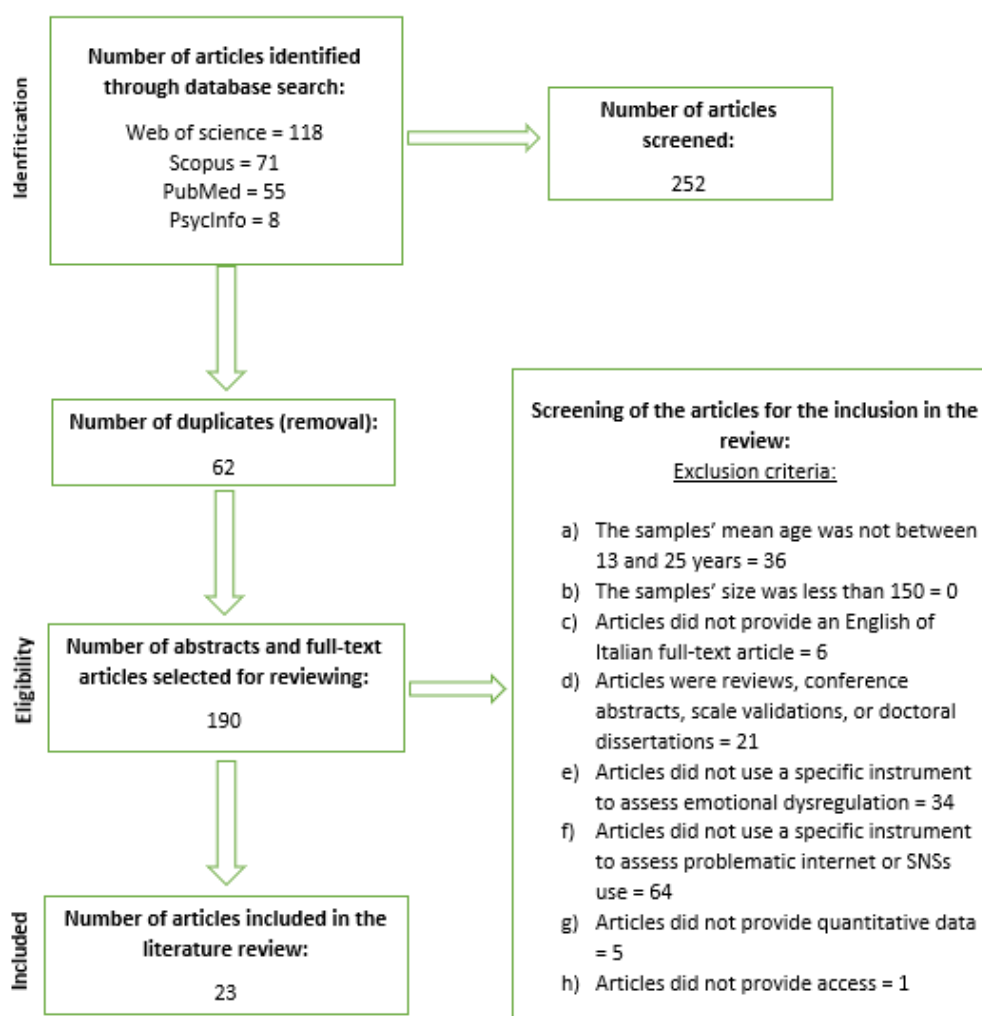


represents the most important source of social support for adolescents, the family-based therapeutic approach might be useful for problematic Internet use prevention. Furthermore, improving emotion regulation skills through peers might help to prevent or reduce problematic Internet use among adolescents and young adults. Parents, teachers, and professionals working with adolescents should help adolescents, especially males, to regulate their emotions, because, compared to females, they cannot easily rely on social support as a protective factor (Mo et al., 2018). In this regard, more findings are required to better understand the existing gender differences in the social support process, so that gender-sensitive practice could be achieved in promoting social support. However, whether the spontaneous remission of problematic Internet use appeared higher among male adolescents (Wartberg & Lindenberg, 2020), developing gender-specific prevention or intervention programs it might be helpful especially for affected girls. Since there is now an abundant literature demonstrating the effectiveness of metacognitive therapy in the treatment of addictive behaviors (Spada, Caselli, Nikčević, & Wells, 2015), it might be useful to develop interventions considering the mediating role of metacognitions between emotional dysregulation and problematic Internet use.

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Figure 1. Flow chart of the search strategy and selection procedure



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