Excessive internet use in young women: What are the implications?

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Purpose of review
There are considerable gender differences in youth engaging in excessive internet use (EIU). This review provides updates based on the recent literature focusing on the EIU in young women to describe its implications including what it constitutes of, its correlates, sequelae and preventive and/or treatment strategies.

Recent findings
Definition of EIU and its conceptualization still requires refinement. Recent studies indicate a changing trend towards female predominance of EIU. Women also differ in their internet use compared with men regarding their preference in the internet content and online activities, motives of use and factors related to access to the internet, including the device, sociocultural restrictions, etc. The correlates and sequelae of EIU encompass psychological, physical, biological, family and social domains that could form the basis of identifying individuals at risk and strategizing treatment.

Summary
The findings indicate the need for standardization in definition and measures of EIU for better recognition of EIU and identification of its at-higher-risk females. Effective preventive and treatment measures are still limited by various methodology flaws outlined here.

Keywords
female youths, internet addiction, problematic use

INTRODUCTION
Excessive internet use (EIU) has gained recognition, despite much deliberation whether it merits clinical attention or not. Numerous researches were conducted particularly in the past 2 decades, as internet has wider applications, uses and better access. The literature has documented what constitutes EIU and its measures, profiled the vulnerable groups and patterns of use. Studies have also identified multiple variables link to EIU, including the interaction between genetic and environmental factors as well as its preventive and treatment strategies.

EIU is largely a disorder of young people, with substantial differences across the genders [1]. Youth used internet excessively to achieve social desirability, and cope with underlying problems and self-criticism [2], in order to meet self-esteem needs and gain social acceptance [3].

Most noted differences across the genders are the preponderance towards EIU, the preference of type and pattern and the motivation of the internet use. For women, recent studies are suggesting a changing trend in the prevalence of EIU and possibly their preference in the use of internet and its applications. Women use the internet more for interpersonal communication [1,4], while men are inclined towards gaming and online pornography. However, Piguet et al. [5] reported an increase in the internet gaming disorder (IGD) among the women in the recent years. This could be a reflection of the internet as a medium that is becoming more appealing across the genders. Moreover, it is also a consideration for the shifting in the social roles and...
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Evidence-based treatment of EIU is limited by flawed methodology in current studies such as inconsistent diagnostic criteria, lack of generalizability.

EIU is mostly a disorder of the young people; however, there is need for more studies to include other populations such as children and older adults for better generalizability.

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**KEY POINTS**

- EIU is mostly a disorder of the young people; however, there is need for more studies to include other populations such as children and older adults for better generalizability.
- Recent studies suggest a changing trend towards female predominance of EIU and possibly their preference in the use of internet and its applications.
- Preventive interventions should be targeted at high-risk females focusing on emotional regulation, self-control and motivation of the internet use.
- Evidence-based treatment of EIU is limited by flawed methodology in current studies such as inconsistent diagnostic criteria, lack of randomization and inadequate controls.

Multiple factors are involved in considering the gender difference in EIU, including hereditability towards behaviour addiction, the discrepancy in psychosocial development, gender role, motivation to use the internet and the internet access, particularly through the easily accessible smartphone device.

The implications of EIU in young women are many; from considering whether gender difference has any bearing in defining EIU and reflecting whether women partiality to different type of internet use has any clinical, sociocultural and/or economic significance; to identifying gender-specific preventive and treatment strategies targeting the high-risk group and general population.

This review updates the literature, focused on four major sections composed of definitions, prevalence and measures of EIU, gender difference in the internet use, EIU and various aspects including psychosocial factors and physical health, and preventive and treatment strategies of EIU.

**DEFINITIONS, PREVALENCE AND MEASURES OF EXCESSIVE INTERNET USE**

Excessive internet use, ‘internet addiction disorder’ [6], internet addiction [7], problematic internet use (PIU) [8], pathological internet use [9], internet use disorder and internet dependence are among the interchangeable terms to describe the internet maladaptive use. For uniformity, EIU is used in this article to refer to all of the above. In EIU, the usage is often described as uncontrolled, time consuming and potentially risky and disrupts daily life functioning [10,11]. It negatively affects an individual’s life on their social, school, work, physical and psychological health.

EIU is an emerging mental health concern, although it is not listed in the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5) [12]. Nevertheless, IGD is included in the disorder requiring further study. Internet-based gambling, on the contrary, is a part of gambling disorder in DSM-5 but not in the diagnostic criteria for IGD. This could reflect the emphasis of the literature on the content-specific online activity in defining EIU. This review covers the entirety of EIU that is rather heterogeneous. It has been a contention whether EIU could stand as an independent disorder. Both IGD and internet gambling, for example are a subset of problems related to EIU. Arguably, the internet may represent as the medium for impulse control disorder rather than the addictive element. Ultimately, the listing of EIU as a psychiatric disorder would be based on whether there is sufficient scientific evidence to justify its inclusion in the future DSM and ICD-11 [13]. However, there is still a need to explore the underlying reasons or motivations for the addictive behaviour [14]. The considerations for gender-specific characteristics of EIU may pose question of whether such differences would have any implication on further defining EIU.

Cunningham-Williams et al. [15] suggested that excessive gambling can only occur in the presence of exposure to gambling and should be examined in the context of increased opportunities to engage in gambling [16]. This is also applicable to other forms of behavioural addiction. This highlights the importance of conditional probability whereby the exposure (to internet) is a condition to establish EIU. It is vital therefore to recognize the rate of EIU only among the internet users and to examine the rates in the current context where many countries may have full access and usage of the Internet, at least in certain age groups.

A recent review on nationally representative samples across several countries reported that the prevalence rates for EIU are between 1 and 18% [17]. The main reason for the varied prevalence is the heterogeneity of study methods, including inconsistent measures of EIU from self-identification of EIU to more vigorous screening based on strict validated criteria such as Internet Addiction Test [18] along with the arbitrary application of variable cutoff points even on the same instrument; sampling selection biases, largely attributed to the use of convenient sampling and overrepresentation of the young population compared with other population, which has restricted its generalizability. Prevalence that is derived from stricter diagnostic
criteria such as DSM reported a narrower range between 9.8 and 15.2% [11,19*]. With stricter criteria, the prevalence should have an overall lower range. However, the prevalence remains widely varied, reflecting that the problem with identifying EIU goes beyond its definition and measures.

The EIU global prevalence is reported at 6%, but variation is recorded across the countries with the Middle East reporting the highest rate (10.9%) and Northern and Western Europe recording lower rates (2.6%) [20]. The empirical data only included reports that used either Young’s Diagnostic Questionnaire [7] or the Internet Addiction Test [18] and might inadvertently exclude other reliable prevalence rates. More recent prevalence studies using other types of psychometric tools, including Compulsive Internet Use Scale [21]; Excessive Internet Use Scale [22]; The Addiction Profile Index Internet Addiction Form [23]; Internet Addiction Proneness Scale [24]; PIUQ-6, Problematic Internet Use Questionnaire [25]; Chen Internet Addiction Scale [26], probably generate equally if not more reliable prevalence rates [17].

GENDER DIFFERENCE IN EXCESSIVE INTERNET USE

Previous studies have inferred that men are at a greater risk of EIU than women [27,28]. Only a handful of studies found no male–female difference in addiction, which was concluded mainly attributed to sampling bias [27]. The male predilection towards EIU has been replicated in the larger epidemiological studies [29,30]. However, new evidence suggests the male predominance in EIU may not be as substantial as before [5**]. Taranto et al. [31] found only slight predominance of males, while a few studies found no significant gender difference in the proportion of adolescents with EIU [32] or at risk of having EIU [4].

In contrast, a few recent studies found a female predominance in the internet use [33–35]. Mihara et al. [33] carried out probably the largest study regarding EIU with over 100,000 randomly selected Japanese adolescents and found that EIU was significantly correlated with females. It was particularly prominent among younger students whereby girls with EIU were double than the boys. The results could not be merely attributed to methodological bias as previously believed. Possibly, this is a reflection of what the internet has become, as a most convenient and accessible means to information and communication along with other functions that serve a wide variety of basic and complex human needs. It encompasses a wide variety of online activities including communications, social media, video conferencing, transferring documents, job application, banking, gaming and even shopping. This rise could be a consequence of major shifts in gambling exposure, as Japan considers legalizing recreational gambling [36] in the context of conditional probability referred earlier [16].

Female preponderance in EIU is not only restricted within certain geographical area or culture but also replicated among multiethnics American students [37]. In this study, despite men spent more hours on the internet and possibly had functional impairments, more women seemed to acknowledge that they had EIU. The authors suggested that the difference in reporting EIU reflect the gap in the developmental rates, with girls becoming mature earlier than boys would instil greater insights into their own behaviour and experience of the consequences EIU [37].

It was stated that the male predominance in EIU was simply because they use internet more often than the women [14]. However, the mechanisms of this gender-related behaviour are evidently not as straightforward. Multiple factors contributed, including genetic or hormonal factors, emotional or psychological needs, perception of self-image, and environmental and sociocultural factors [38].

Long et al. [1] studied those who used the Internet normally and found a combination of genetic and shared environmental factors significantly contribute to familial aggregation in their internet use. On the contrary, Vink et al. [39] found that individual differences in compulsive Internet use were due to genetic and unique environmental factors, but not by the shared environmental factors within the family. There was no significant difference in the heritability estimates between the genders too. This differs from the study in China that found a higher heritability for men than women [40]. The role of sociocultural restriction in limiting the genetic expression of EIU was suggested [40].

Munno et al. [41*] reaffirms that men have higher predisposition towards behaviour addiction including internet because of its significant association with impulsiveness and aggression. Interestingly, the personality determinants in women, identified as less impulsive, disinhibited and ‘alexithymic’ than the men, were found to make the women less vulnerable to dependence. The term alexithymia refers to ‘inability to identify and describe emotions in the self’. Other protective factors against internet addiction for women include greater awareness of self-knowledge and more ability to understand and control one’s action. Women also have better family support in reaching independence [41*]. Contrarily, Schimmenti et al. [42*]
argued that alexithymic traits among women make them vulnerable to EIU. In addition, the authors found that previous exposure to trauma increases the risk of EIU in male youths.

Perhaps the most consistent finding regarding the gender difference is the gender behaviours in their internet use. The findings so far have implicated that women differ in their internet than men regarding their preference in the internet content and online activities, motives of use and factors related to access to the internet, including the device, restrictions, etc.

Firstly, several gender-specific applications were identified that led to EIU. For women, they utilized more of the social network [1,4,14,33] blogs and bulletin boards [33], while men used the preferred to access games [1,41*], gambling [1] and adult sites [4]. Both genders shared equal predilection towards downloading applications [4,14,33]. Notably, women accessed more online gaming nowadays, although it was previously considered a male predominant activity [5**].

Secondly, the motivations that drive the EIU differ between the genders. For women, it is pertaining to information search, study-work related [43**], social function, communication or leisure [5**]. These are particularly addictive, as they fit their needs of peer interaction and acceptance. Women with higher alexithymic traits used internet excessively to regulate their emotion through online social interactions [42*]. Men were more likely to surf the internet for leisure activities, including playing online games, downloading music and watching videos [43**]. Hellström et al. [29] reported that gaming was prevalent among men due to fun, demands from other players, to attain status and as an escapism from their problems. Women were more likely to go online alone than men. Thus, women’s behavioural patterns and motivation of use might lead to social isolation, subsequently resulting in negative emotion and depression [43**].

Thirdly, compact devices including smartphones and tablets for the internet access have been shown to be directly linked to EIU [5**]. The devices, with its portability and accessibility, are becoming a status symbol and socially fitting device that their use easily becomes uncontrolled. Evidently, women owned and used cell phones more intensively and frequently than men [5**]. Nevertheless, the restriction posed by the sociocultural norm played a role in appreciating the gender difference in the internet use [40].

These have brought on multiple implications that are further discussed in various segments in the following sections.

EXCESSIVE INTERNET USE AND ITS PSYCHOSOCIAL CORRELATES IN YOUNG WOMEN

Among the most studied aspect of EIU was the impact of EIU on psychosocial domains and vice versa. The internet has become part of modern lives whereby a person builds social network, seeks self-identity, searches for information and finds leisure [44]. The internet would understandably impair mental health through for instance, websites that promote self-harm or trigger negative emotional reaction. However, there were consequences of the internet use (e.g. sleep loss) and its withdrawal, rather than the specific internet activities themselves that appear to predict the psychological sequelae of EIU [44].

Liang et al. [43**] conducted a longitudinal study that showed EIU might lead to depression in female adolescents, supporting the social displacement hypothesis. However, male adolescents were more likely to overindulge in the Internet because of depression, which supported the mood enhancement hypothesis. A prospective study among college students in China who were exposed to increased screen time, reported a higher risk of anxiety, depression and psychopathological symptoms at 1-year follow-up [45]. Another prospective study, also among Chinese adolescents, found depression but not anxiety as a consequence of pathological internet use at 9 months’ follow-up [46]. Heavy gaming among adolescents was found to cause depression and incomplete schooling 5 years later. Inconsistent with previous findings, the author did not find negative consequences of heavy gaming with general health, marijuana use and obesity [47].

Various psychological variables had been implicated with excessive internet and social media use among youth, including low psychological well being [5**,48], psychological distress [2,49], low self-esteem [14,50,51], low self-control, impulsivity [52] and attention deficit hyperactivity disorder [53], poor social support [54*], depression [50,55–60], anxiety [31,60,61], suicidal ideas and attempt [2,49,62], fear and aggression [2,63], eating disorders [64] and sleep difficulties [59]. Interestingly, psychological health problems were higher among women than men. Girls who had depressive symptoms were at a higher risk of developing EIU than boys with similar risk factor [65], suggesting the potentially higher negative psychological impact of EIU among women. Contrarily from most studies, Ziv and Kiassi [66] found that Facebook use was positively correlated with psychological well being, particularly for youth with low mental resilience.
Social correlates such as lower recreational activities, poor academic performance, social withdrawal are common among youth with EIU [63,67]. IGD, in particular, was associated with significantly higher emotional and behavioural problems among girls than among boys, increased risk of aggressive behaviour, poor school performance, social and thoughts problem [63]. Risky behaviour such as cyberbullying, meeting strangers online and dating violence [68,69] showed significant association with excessive use of social media that were reported to be higher in young girls [50]. At 6-month interval, EIU were found to predict cyberbullying and meeting strangers online [68]. Young people with high involvement in sexting were more likely to become perpetrator as well as victims of dating violence [69]. A Swedish study found that youth who performed online sexual behaviour were more likely to have sex offline with strangers they met online [51].

The impact of family and parental involvement and relationship in youth with EIU has been discussed before [3,70]. Many studies reported greater family dysfunction, limited family support, negative family environment, parental internet use [71] and poor parental regulation amongst families of EIU compared with those without [3,51,53,55]. Mojaz et al. [72], in a cross-sectional study among married college students, found EIU increased emotional divorce and decreased marital satisfaction. Excessive use of social media shown to cause parental distraction, decreased parental engagement and making a child more likely to be at risk for injury [73]. Nevertheless, parents with a higher level of internet knowledge and awareness and hold a positive attitude towards the internet are more effective in guiding their adolescents in using the internet [71,74].

Most study designs were cross-sectional with few exceptions mentioned earlier, thus establishing causal relationship is difficult. There is a need for more prospective studies to further understand the consequences of EIU particularly among young women. The few prospective studies available were limited by the small sample size, inadequately explored confounding factors, self-reported measures and failure to identify protective factors [47]. Other limitations include unclear validity of assessments tool, with no clear cut-off duration for the use of internet or online gaming [47].

EXCESSIVE INTERNET USE AND PHYSICAL SYMPTOMS IN YOUNG WOMEN

There are considerable number of studies documented an array of physical symptoms suffered by those with EIU. Some of these were found to be significantly higher among female adolescents [29,75] than males. These include neck and back pain [29,60,75], headache, stomach ache [29] and fatigue [75]. These symptoms were positively correlated with gaming time [29,60,75] and also linked to negative gaming motives [29].

The sedentariness of internet-related activities is probably the main factor contributing to overweight and obesity [76,77] in young people with EIU. In contrast, a longitudinal study found no significant association between overweight and internet use but mostly influenced by baseline weight. Overweight adolescents are at a higher risk of increasing more weight with increased use of internet [78**]. When the online activities are coupled with unhealthy behaviour such as smoking [34] and alcohol use [49,79], the impact of EIU is made worse.

Similar to studies on psychological correlates and consequences, most studies on physical symptoms were cross-sectional, thus making it impossible to establish the temporal causal relationship between EIU and physical symptoms.

PREVENTIVE AND TREATMENT STRATEGIES OF EXCESSIVE INTERNET USE

Current research works highlight more on EIU risk factors and its complications but scarce in its preventative and treatment strategies [68]. Whether studies on prevention and treatment strategies of EIU deserve similar attention as in other forms of behavioural addiction is debatable, as there is concern on its unclear conceptualization. Furthermore, it has yet to be recognized in psychiatry as a specific disorder as mentioned in DSM-5 criteria. In addition, it does not carry any social stigma, as the use of ICT is encouraged and legitimized globally. In light of this, studies on treatment of internet addiction have only begun to gain attention, but many of them are limited by their flawed methodology such as inconsistent definition of the term internet addiction, lack of randomization, blinding techniques, adequate controls or comparison groups [80].

Amidst such controversies, studies indicated that EIU is becoming more prevalent especially among youth. EIU is correlated with several risk factors such as psychological [5**,51,52], social [63,67–69] and family factors [3,70]. Therefore, strategies to curb this issue are mainly focusing on preventive measures rather than specific focused treatment unless there is presence of other comorbid illnesses. Stakeholders such as policy makers, educators and medical experts agreed that preventive strategies that address risk factors that predisposed
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individuals to EIU should accompany the focused treatment plan [81]. In addition, preventive measures involve not only the individuals with EIU, but it should also represent a transdisciplinary approach whereby roles of family, schools or workplace and community are taken into account, as they are part of the formative environment of the risky individuals [82**].

To date, there are no gender-specific preventive or treatment strategies regarding EIU. However, a review of prevention of internet addiction has indicated that for selective and indicated prevention, at-risk individuals should be identified for prevention interventions [82**]. Gender differences among EIU have implicated that internet use behaviours differ between men and women in their preference in the internet content and online activities, motives of use and factors related to access to the internet including the device and restrictions. Women used internet excessively to cope regulate their emotion through online social interactions [42*]. They were more likely to go online alone than men and their motivation of use might lead to social isolation resulting in negative emotion and depression [43***]. They owned and used cellphones more intensively and frequently than men [5**]. Therefore, screening for women with poor emotional well being regulation, poor self-control on devices accessibility and motivation for internet use is recommended to identify their risk to become EIU.

Regarding treatment of EIU, recent evidence indicated that an individual-based approach with a combination of pharmacotherapy and psychotherapy appeared to be effective [83]. Previous reviews on clinical and treatment studies were limited by overly restrictive inclusion criteria, which excluded more comprehensive investigation on internet-use related addictions and resulted in questionable internal validity of the study [80,83–85]. A comprehensive review on internet addiction and PIU has revealed that patients who suffered from internet-use related problem also presented with comorbid illnesses such as anxiety and mood disorders [86]. As these comorbidities are prevalent among individuals with internet-use related problem, it is commonly found that antidepressants and benzodiazepine are frequently prescribed to them. It is indicated that these medications have proven efficacy in reducing symptoms of internet addiction and other comorbid symptoms such as depression and anxiety.

The review has also implicated that cognitive behaviour therapy (CBT) or its variation is the most common individual therapy applied to the individuals suffered from internet-use related problems [86]. The use of CBT was popular based on the cognitive-behavioural model of pathological internet use whereby its development and maintenance are influenced by cognition [8]. However, Winkler et al. [85] reported in their meta-analysis that the use of CBT did not show any significant benefit from other psychological therapy. Meanwhile, group therapy has been reported to show several advantages over an individual therapy to create support network and well tolerated environment for discussing sensitive issues pertinent to internet use along with gain the benefit of learning from others and help in improving individuals’ coping skills [12]. The review also examined on combined therapies such as CBT supplemented with other forms of psychological therapies or pharmacotherapy and they are efficacious in treating the internet-use related problems. However, limited benefits were reported on other comorbid symptoms.

CONCLUSION

EIU is a generic term for maladaptive use of internet, but its definitions and measures still need further validation and standardization. In young women, EIU is implicated in their preference of online activities, behaviour and motives of use that may reflect emotional dysregulation and lead to psychosocial complication such as social isolation, or vice versa. More prospective and in-depth studies are needed to have clear understanding in order to implement an effective prevention and intervention of EIU, targeted at both at-risk and general population.

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REFERENCES AND RECOMMENDED READING

Papers of particular interest, published within the annual period of review, have been highlighted as:

* of special interest
** of outstanding interest


This is the first study to provide insight on the characteristics and online activities of problematic and regular Internet users in a large sample (n = 1549) among young girls.


The study highlights the complexity of internet and family relationship. It is important for preventive measures and effective intervention.


27. www.co-psychiatry.com
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A 2-year longitudinal study providing insight on EIU and weight. Being overweight at baseline is the main predictor of an overall overweight compared with EIU.


83. The first systematic review of scientific articles (January 1995–April 2016) focused on the prevention of Internet addiction.


