The global popularity of online gaming continues to grow, as the gaming industry diversifies its products and leverages new technologies to expand its market [1,2]. Although the mainstream media tend to focus on best-selling competitive online shooter games, such as Fortnite and Call of Duty, gaming has become quite diverse and wide ranging. Gaming innovations have occurred in genres (e.g., role-playing, simulation, and puzzles), hardware and accessibility (e.g., smartphones, tablets, and virtual reality), social features (e.g., cooperation and teamwork), and playability (e.g., interactive narrative and content creation). The industry has also expanded its social functionality by linking and integrating games with social media and streaming platforms (e.g., Twitch and Mixer) [3]. Such developments have likely contributed to changing demographic profiles of gamers, which include an increasing female adolescent population involved in gaming activities, particularly those that intersect with social media and related online activities.

Academic and industry research confirms that the “gender gap” in gaming participation has been closing, particularly in the last decade. According to Statista [4], in 2006, approximately 38% of U.S. gamers from 4,000 households were female compared with 46% in 2019. Similarly, industry research in Australia has reported that 38% of gamers were female in 2005 compared with 47% female in 2019 [5]. Australian females aged 14–25 years play games for an average of 81 minute/day [5], and approximately 1% play games for 9 hours or more on a weekday [6]. The proportion of female developers in the gaming industry increased from 11% in 2005 to 21% in 2017 [7,8], and their influence on game content may be related to increased female engagement in gaming.

With the “hazardous gaming” (QE22) and “gaming disorder” (GD; 6C51) criteria included in the latest revision of the International Classification of Diseases, 11th Revision [9,10], it is timely to consider the importance of gender in understanding excessive and addictive gaming. In our view, more research and clinical attention on female gamers is needed, including greater female representation in current research in addition to more studies to understand female gaming experiences. Selective sampling of males for convenience or based on reasoning that males are more vulnerable to GD contributes to the view that GD is largely a male disorder, despite evidence that females are also at risk [11]. Girls spend more time involved and become problematically involved with social media than gaming [12–16], but gaming may be a critical part of the online ecosystem in which some girls develop excessive habits. Speculatively, teenage girls’ involvement in a wide range of online activities may contribute to greater risk of later problematic internet use. Research from other addictions field has shown that females tend to engage in addictive behaviors later in life but develop problems more quickly, a phenomenon known as “telescoping” [17,18]. The extent to which telescoping is applicable to GD and other forms of problematic use of the internet warrants direct examination.

Epidemiological research shows that female problematic gaming is not uncommon and should not be downplayed [19–21]. A meta-analysis by Fam et al. [22] reported that the pooled prevalence of GD among female adolescents was 1.3% and higher in Asian countries, particularly China [23]. This prevalence is comparable to the prevalence of problem gambling among adults [24]. Relatively lower problematic gaming prevalence
among girls has been attributed to tendencies to play casual, simulation, and puzzle games [25,26] compared with males who engage in competitive games that often require longer play [27]. The risk of GD among females may increase as more time consuming games become more appealing to females.

Neurobiological studies by Dong et al. have examined the gender gap in problematic gaming, which has identified (1) more craving-related activations to gaming cues in males compared with females [28]; (2) gender-related differences with respect to craving-related functional connectivity between executive control and reward systems linked to the dorsolateral prefrontal cortex and striatum [29]; and (3) greater differences in left dorsolateral prefrontal cortex activation in the GD versus clinical groups in females compared with males, suggesting that females with GD may have greater difficulty in controlling their gaming under craving conditions [30]. However, only a very limited number of imaging studies have involved females. A meta-analysis by Yao et al. [31] reported that only two of 27 functional magnetic resonance imaging studies, and four of 10 2voxel-based morphometry studies, included females. Voxel-based morphometry studies suggest that greater alterations exist in the anterior cingulate cortex, supplementary motor area, and orbitofrontal cortex regions in females with GD. Similarly, research on response inhibition involving neurocognitive tasks administered to GD patients has been almost exclusively conducted with males [32].

The literature on interventions for GD has demonstrated a similar male bias [33,34], and therefore, our knowledge of treatment efficacy for females is limited. A clinical trial by Wöllling et al. [35], for example, involved a manualized cognitive behavioral therapy administered to males only. A craving behavioral intervention study involved solely males [36]. Retreats for adolescents that focus on “technology detox,” developing social skills, and learning self-control have also tended to involve males only [37]. Aside from the lower prevalence of GD in females, the rationale for excluding females has been the lack of females seeking treatment for gaming-related problems. Lau et al. [38] examined the records of 5,820 clinically referred youth in the Canadian mental health system and reported that the prevalence of excessive gaming that interferes with daily functioning was 19.2% in males and 4.9% in females. Based on correspondence with Cam Adair, who operates Game Quitters (https://gamequitters.com), between 5% and 10% of site visitors who seek help or advice are female, which suggests an unmet treatment need. Although presently speculative, female problematic gaming and GD may be less detected because of other comorbid issues (depression and personality issues), other immediate concerns or crises (e.g., self-harm and family conflict), and/or other internet-based issues (e.g., risky social media use).

Here we have only briefly considered some evidence and gaps in understanding of gender-related differences in GD. Nonetheless, it is evident that some female adolescents are avid gamers and report problematic gaming, albeit generally to a lesser extent than males. However, females are an understudied and less detected population in important areas of clinical research. With growing scientific interest in a range of excessive behaviors and how they may be interconnected [39], it is important that vulnerable teenage girls do not remain “hidden” because of their exclusion from research. Greater efforts are needed to improve our knowledge of female gamers and their needs and develop best practice guidelines for prevention and other interventions for this smaller but important population.

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