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7 **The prevalence of mental ill health in elite Counter-Strike athletes**

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Abstract

32 The present study provides a unique contribution to the literature by offering the first study to
33 examine the prevalence of mental ill health and mental wellbeing of professional Counter-Strike
34 athletes. The sample consisted of 51 current Counter-Strike professionals ($M_{age} = 23.22$, $SD =$
35 4.7 years; Male = 48, Female = 3) representing 17.1% of all registered Counter-Strike
36 professionals. An online questionnaire battery was administered via Qualtrics. We found that one
37 quarter of our sample reported moderately severe (15.7%) and severe (9.8%) symptoms of
38 depression using the PHQ-9, over three quarters (82.4%) reported symptoms of
39 anxiety/depression using the GHQ-12, over half (54.9%) reported psychological distress using
40 the distress screener, and nearly three quarters (72.5%) reported low mental wellbeing using the
41 SWEMWBS. Our findings suggest that greater importance should be placed on screening and
42 intervention support by both performance and clinical practitioners to facilitate mental health
43 within the esports ecosystem.

44 *Key Words:* wellbeing, anxiety, depression, distress, professional, esports

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Introduction

48 Mental health can be defined as ‘a state of wellbeing in which every individual realises
49 his or her own potential, can cope with the normal stresses of life, can work productively and
50 fruitfully, and is able to make a contribution to his or her community’ (The World Health
51 Organisation, 2022, pp. 8), and is synonymous with the term ‘flourishing’ (Keyes, 2002, pp. 210).
52 Accordingly, mental ill health refers to a negative state of wellbeing, and severe mental ill health
53 refers to diagnosable disorders such as depression or panic disorder. According to a 2019 report
54 by the World Health Organization (WHO), nearly one billion people worldwide were living with
55 a mental disorder, with anxiety and depression being the most common disorders (WHO, 2022).
56 Indeed, a meta-analysis using over 390,000 participants representing 32 countries estimated rates
57 of depression (28%), anxiety (26.9%), and psychological distress (50%; Nochaiwong et al.,
58 2021). Despite the lack of a universally agreed definition of wellbeing, there appears to be some
59 consensus that it encompasses both hedonic (happiness through striving for rewarding
60 experiences) and eudaimonic (personal qualities which promote achievement and living well)
61 components which can predict flourishing in multiple life domains (Forgeard et al., 2011; Hone
62 et al., 2014; Huppert & So, 2013; Huta & Ryan, 2010; Longo et al., 2017).

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64

Research has highlighted that elite athletes are particularly susceptible to mental health disorders and lower mental wellbeing, with over 640 distinct stressors potentially contributing to

65 poor mental health (Arnold & Fletcher, 2012). An increasing number of reviews and meta-
66 analyses show that competing at the elite level is related to an increased prevalence of mental
67 health including anxiety and depression (e.g., Akesdotter et al., 2020; Foskett & Longstaff, 2018;
68 Goutteborge et al., 2019; Kuettel et al., 2020; Nicholls et al., 2020; Rice et al., 2016). For
69 example, a meta-analysis by Goutteborge et al. (2019) using elite athletes (competing at the time
70 of the study) found 19.6% and 33.6% for the prevalence of distress, and anxiety and depression,
71 respectively. Consensus statements have also highlighted further stressors faced by those
72 competing at the elite level and the subsequent impact of these stressors on mental ill health,
73 including high training loads, competition stress, insufficient recovery, and high likelihood of
74 experiencing injury, leading to insomnia, and suicidal thoughts (e.g., Henriksen et al. 2020;
75 Reardon et al., 2019). Ultimately, such experiences are a particular concern for elite athletes
76 given their association with increased anxiety (Nicholls et al., 2016) and possibly self-regulation
77 (Welsh et al., 2023), which in turn, has been shown to negatively impact performance (Sharpe et
78 al., 2024; Trotter et al., 2023; Wolanin et al., 2015). Given the apparent susceptibility of athletes
79 to suffer from mental ill health, more research is needed to advance our understanding of the
80 prevalence of mental ill health in athletes (Goutteborge & Aoki, 2014).

81 Unsurprisingly, mental health is also an important issue in elite esports athletes (Cottrell
82 et al., 2019; Pereira et al., 2019; Shen & Cicchella, 2023). Esports can be defined as the
83 competitive play of specific video games that provides professional or personal development to
84 the player (Pedraza-Ramirez et al., 2020). Preliminary research has identified a range of stressors
85 faced by elite esports athletes including personal performance, team issues, audience/opposition,
86 social media, and life outside of competing (Leis et al., 2022; Poulus et al., 2022; Smith et al.,
87 2019). Although these stressors are reported to negatively impact esports performance (e.g., Leis
88 et al., 2022), little is known about the prevalence of mental ill health in elite esports athletes.
89 Preliminary research by Pereira et al. (2021) using competitive FIFA video game players showed
90 the prevalence of distress (22.2%), anxiety (38%), and depression (37.1%) symptoms. Indeed,
91 the observed values are comparable to the prevalence of distress (14.8%) and anxiety (37.9%)
92 reported by professional football players (Goutteborge et al., 2015a). Research by Smith et al.
93 (2022) found sleep quality, burnout, and social phobia anxiety, as well as three specific categories
94 of stressors (i.e., personal concerns, game-specific uncertainty, in-game pressure), predicted
95 mental ill health. Furthermore, Poulus et al. (2024) used network analysis and identified that
96 resilience negatively related to symptoms of burnout and avoidance coping positively related to
97 symptoms of burnout in competitive esports players. While research by Smith et al. (2022) used
98 313 university based competitive first-person shooter esports athletes and Pereira et al. (2021)
99 used 292 FIFA athletes who competed at both national and international competitions, there is
100 an absence of research which has examined professional esports athletes. Such research may

101 support practitioners in effectively developing personal growth, functioning, and performance.
102 Research is therefore warranted to advance our understanding of the prevalence of mental ill
103 health and mental wellbeing in elite esports athletes.

104 To the authors' knowledge, no research has explicitly examined the prevalence of mental
105 ill health and mental wellbeing in professional esports athletes. Given the need to capture the
106 feelings, functioning, and life satisfaction of individuals when assessing overall mental health
107 (Huppert, 2009; Stranges et al., 2014), we adopted measures of both mental ill health and mental
108 wellbeing. It is important for the esports community (e.g., competitors, coaches, support roles,
109 managers, sport scientists, event organisers, key funding bodies) to recognise the importance of
110 mental health and mental wellbeing to provide early and effective interventions when supporting
111 esports athletes. This may include providing access to mental health professionals, implementing
112 mental health policies (e.g., event organisers considering rest periods in competitive schedules),
113 promoting a healthy work-life balance, and providing education and resources on mental health
114 and mental wellbeing (e.g., Cottrell et al., 2019). Therefore, the aim of the present study was to
115 examine the prevalence of mental ill health and mental wellbeing in professional Counter-Strike
116 athletes.

117 Method

118 Participants

119 We successfully contacted 147 Counter-Strike athletes, yet 96 participants were excluded
120 due to not being a current registered Counter-Strike professional ($n = 79$) and/or excluded from
121 the analysis for failing to fully complete the questionnaires ($n = 17$). For a detailed description of
122 Counter-Strike see Sharpe et al. (2022). A total of 51 currently registered Counter-Strike
123 professionals ($M_{\text{age}} = 23.22$, $SD = 4.7$ years), with varying durations of experience at a
124 professional level ($M_{\text{experience}} = 39.41$, $SD = 31.84$ months), participated in the present study. The
125 sample consisted of three females (6%) and 48 males (94%). At the time of this study (January
126 to June 2022), a total of 299 Counter-Strike athletes were registered as professional competitors
127 according to PROSETTINGS.NET, and thus our sample constitutes 17.1% of this population.
128 The categorisation of our professional sample is in line with the work of Mendoza et al. (2023).
129 Specifically, 76.5% played at least one tournament with a EURO500,000 or above prize pool
130 (which is the highest level of competition as of 2023) in the last 12 months. All participants
131 competed in regulated online ($M = 20.35$, $SD = 20.87$) and Local Area Network (LAN; $M = 3.59$,
132 $SD = 3.50$) competitions in the last 12 months. Practice hours per week included individual
133 practice ($M = 31.71$, $SD = 24.57$ hours), team practice ($M = 22.78$, $SD = 12.57$ hours), practice
134 with coach ($M = 7.00$, $SD = 8.60$ hours), and recreational play ($M = 14.94$, $SD = 18.61$ hours).
135 To gain an understanding of our sample's current mental health care provision, we asked whether

136 they had been offered mental health support by their current or former professional team(s) with
137 the majority not being offered support (No = 68.6%; Yes = 13%; Unsure 5.9%; No response =
138 12.5%). Ethical approval for the study protocol was awarded by the lead author's Research Ethics
139 Committee. The ethical approval obtained for this study adhered to rigorous data protection
140 protocols, specifically designed to exclude sensitive personal information. This measure was
141 implemented to uphold confidentiality and protect the identities of participants, who, in this case,
142 are professionals in the public eye. The omission of certain demographic information aligns with
143 the study's focus on mental health and the need to prioritise the confidentiality of the individuals
144 involved. All participants provided informed written consent prior to completing the online
145 questionnaire battery.

146 **Procedure**

147 We would like to highlight that we collaborated with author AA who is a trained
148 psychiatric physician, given that Kroenke et al. (2001) states that the PHQ-9 should only be
149 administered by trained professionals. The survey was made available online using Qualtrics
150 (<https://www.qualtrics.com/>) and posted on X (formally Twitter) accounts of the authors, in
151 Counter-Strike related Reddit forums, and sent to personal contacts of the authors. Professional
152 Counter-Strike athletes also distributed the survey within their competitive network. Once
153 opened, the survey provided all key information, including the information sheet and informed
154 consent form. If informed consent was received, participants were asked to complete a series of
155 basic demographic questions (age, gender, months active as a Counter-Strike professional),
156 followed by four instruments to measure mental ill health and mental wellbeing. All participants
157 were debriefed during the final section of the survey which signposted mental health support
158 links and directed participants to seek professional guidance from their general practitioner if
159 questions elicited any assumed symptoms of mental ill health. Average completion time was 14
160 minutes.

161 **Measures**

162 *The Patient Health Questionnaire*

163 The Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001) was used to screen for
164 depression, and provide an indication of severity¹. The nine items cover experiences of pleasure,
165 feeling down, sleep disruption, energy levels, appetite, feelings of failure, trouble concentrating,
166 speaking slowly or being fidgety and having negative thoughts around suicide or self-harm over
167 the previous two weeks. An example item is "Feeling down, depressed or hopeless". Participants

¹ To differentiate discussions about the PHQ-9 and the GHQ-12, depression severity will be used to reference reported scores using the PHQ-9 and 'anxiety/depression' will be used to reference GHQ-12 scores (Armino et al., 2021).

168 are asked to respond to the stem “Over the last 2 weeks, how often have you been bothered by
169 any of the following problems?” using a 4-point Likert scale ranging from 0 (not at all) to 3
170 (nearly every day). As a severity measure, the PHQ-9 score can range from 0-27. Researchers
171 have used a cut-off score of 10 or higher to indicate symptoms of depression (He et al., 2020).
172 Indeed, meta-analyses have defined acceptable cut-off points between 8 and 11 (Manea et al.,
173 2012) and scores ≥ 10 had a sensitivity of 80–90% of detecting major depressive disorder (Levis
174 et al., 2019). We used the following thresholds suggested by Kroenke et al. (2001) to distinguish
175 severity of depression including none (0-4), mild (5-9), moderate (10-14), moderately severe (15-
176 19), while scores equal or above 20 represented severe depression. Several studies have supported
177 the diagnostic accuracy and psychometric properties of PHQ-9 (El-Den et al., 2018; Kroenke et
178 al., 2001, 2010; Levis et al., 2017; Manea et al., 2017). The internal consistency of the PHQ-9 in
179 the present study was acceptable (Cronbach’s $\alpha = 0.91$), with values above 0.70 denoting
180 acceptable reliability (Nunnally & Bernstein, 1994).

181 *The General Health Questionnaire*

182 The General Health Questionnaire – short form (GHQ-12; Goldberg et al., 1997) is a 12-
183 item instrument used to assess anxiety/depression experienced in the previous four weeks. An
184 example item is “Have you recently felt constantly under strain?”. Participants are asked to
185 respond using a 4-point scale (“not at all,” “no more than usual,” “rather more than usual” and
186 “much more than usual”) and data were analysed using the traditional GHQ binary scoring
187 method (0-0-1-1). A total score between 0–12 was obtained by summing responses, with scores
188 ≥ 2 indicating symptoms of anxiety/depression (Goldberg et al., 1997). Research has adopted this
189 threshold with both athletic and non-athletic populations in comparable research (Goldberg et al.,
190 1997; Gouttebauge et al., 2015a). The psychometric properties of the GHQ-12 have been
191 supported including internal consistency ($\alpha = 0.76 - 0.94$: Anjara et al., 2020; Lesage et al., 2011)
192 and criterion-related validity (sensitivity = 0.763, specificity = 0.834, Area Under ROC Curve \geq
193 0.83; Goldberg et al., 1997). The internal consistency of the GHQ-12 in the present study was
194 adequate (Cronbach’s $\alpha = 0.66$) given that it approached an acceptable level ($\alpha > 0.70$; Nunnally
195 & Bernstein, 1994).

196 *Psychological Distress*

197 A 3-item scaled distress screener (Foskett & Longstaff, 2017; Gouttebauge et al., 2015b;
198 Gouttebauge et al., 2015a; Gouttebauge et al., 2016), based on the Four-Dimensional Symptom
199 Questionnaire (4DSQ; Terluin et al. 2006; Braam et al., 2009), was administered to assess
200 psychological distress experienced in the previous four weeks. The present study assessed
201 distress given that it has previously been defined as being independent from either anxiety or
202 depression (Terluin et al. 2006). An example item is “Have you recently suffered from worry?”.

203 Using the same scoring used for the 4DSQ (van Rhenen et al., 2008), responses are provided
204 using 4-point scoring system and scored as follows; absence of distress ('no': 0 points),
205 doubtfully present ('sometimes': 1 point), or present at a clinically significant level ('regularly
206 or very often': 2 points). A total score between 0–6 was obtained by summing responses. Like
207 previous research using elite athlete samples (Braam et al., 2009; Goutteborge et al., 2016;
208 Terluin et al. 2006), we used a score of ≥ 4 to indicate symptoms of psychological distress.
209 Previous literature has demonstrated adequate internal consistency (α range = 0.60 – 0.70; Braam
210 et al., 2009; Goutteborge et al., 2017), with the value obtained for the present study being
211 acceptable ($\alpha = 0.82$; Nunnally & Bernstein, 1994).

212 *The Short Warwick-Edinburgh Mental Wellbeing Scale*

213 The Short Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS; Stewart-Brown
214 et al. (2009) was used to access positive aspects of mental health. The 7-item measure, which is
215 derived from the original 14 item Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS
216 Tennant et al., 2007), provides a general measure of overall mental wellbeing, including
217 subjective wellbeing and psychological functioning. Each question has a 5-point score system
218 ranging from 'strongly disagree' (1) to 'strongly agree' (5). Items cover different aspects of
219 eudaimonic and hedonic wellbeing and are positively framed including "I've been feeling
220 relaxed". Individuals were asked to indicate which score best describes their experiences over
221 the last two weeks. Responses produce a global score between 7-35. Although the items of the
222 SWEMWBS better represent psychological functioning than subjective feeling states, the
223 superior scaling properties and reduced completion time have made the short version the
224 instrument of choice for many recent studies examining mental wellbeing (Fat et al., 2017).
225 According to Fat et al. (2017), scores between 7.0-19.3 indicate low mental wellbeing, 20.0-27.0
226 indicate normal mental wellbeing, and scores between 28.1-35 indicate high mental wellbeing.
227 Construct validity has been confirmed using confirmatory factor analysis and Rasch modelling
228 (Fat et al., 2017; Koushede et al., 2019; Melendez-Torres et al., 2019; Stewart-Brown et al., 2009;
229 Vaingankar et al. 2017) alongside test-retest reliability (Sun et al., 2019). Fat et al. (2017) has
230 found acceptable Cronbach's alpha ($\alpha = 0.84$), with the present study also providing support (α
231 = 0.91; Nunnally & Bernstein, 1994).

232 **Data Strategy**

233 All data were processed using the statistical software IBM SPSS statistics 23.0 for
234 Windows. We want to emphasize that the authors who processed the data all have prior
235 experience in mental health esport research. Additionally, the lead author who has expertise in
236 psychometrics evaluated the properties of each scale and author AA who has expertise in
237 clinical psychiatry assisted in the interpretation of the data. Given calls to improve mental

238 health and mental wellbeing prevalence and incidence comparisons, means and standard
239 deviations were reported as well as percentages (Goldberg et al., 1998). The authors wish to
240 emphasise that the present study exclusively focuses on the prevalence of mental ill health. For
241 readers with an interest in exploring associations, correlations can be accessed via
242 <https://osf.io/dtv5r>.

243 **Results**

244 The mean PHQ-9 score was 9.18 ($SD = 7.26$) with 15.69% and 9.80% reporting
245 moderately severe and severe depression symptoms, respectively (Kroenke et al., 2001). Using
246 Goldberg et al.'s (1997) guidelines, 82.35% reported symptoms of anxiety/depression ($M = 4.39$,
247 $SD = 2.69$) as measured by the GHQ-12, while 54.90% ($M = 3.51$, $SD 1.97$) reported symptoms
248 of psychological distress (Braam et al., 2009; Gouttebarga et al., 2016; Terluin et al. 2006). The
249 mean wellbeing score was 17.90 ($SD = 7.64$) with 72.55% reporting low wellbeing (Fat et al.,
250 2017). Absolute and relative percentages of prevalence are presented in Table 1 while means and
251 standard deviations for the respective measures are presented in Table 2.

252 INSERT TABLE 1 HERE

253 INSERT TABLE 2 HERE

254 **Discussion**

255 The aim of the present study was to examine the prevalence of mental ill health and
256 mental wellbeing in professional Counter-Strike athletes. We found that one quarter of our
257 sample reported moderately severe (15.7%) and severe (9.8%) symptoms of depression using the
258 PHQ-9, over three quarters (82.4%) reported symptoms of anxiety/depression using the GHQ-
259 12, over half (54.9%) reported psychological distress using the distress screener, and nearly three
260 quarters (72.5%) reported low wellbeing using the SWEMWBS.

261 The authors would like to emphasise that the ensuing discussion does not posit esports,
262 particularly Counter-Strike, as a causal factor for any reported mental ill health. Conversely, the
263 data serves the purpose of offering insights into the mental ill health and mental wellbeing of
264 individuals. It is important to acknowledge that issues relating to mental ill health can stem from
265 various sources such as early childhood trauma, negative experiences, and genetic
266 predispositions, among others (e.g., Baldwin et al., 2023; Liu et al., 2023). These factors may be
267 unrelated to an individual's chosen career, hobby, or current lifestyle. It is imperative for future
268 researchers and practitioners operating within the esports domain to diligently undertake efforts
269 to comprehend individual needs more effectively. This involves educating individuals about
270 signs, symptoms, management strategies, and treatments related to mental health. Furthermore,
271 there is a pressing need to develop both short- and long-term interventions aimed at preserving

272 positive aspects of mental wellbeing (Enns et al., 2016; Iasiello & Agteren, 2020), thus mitigating
273 the potential negative impact of mental ill health on a competitor's ongoing personal and
274 professional life, both of which are imperative for the sustainability of esports across all levels of
275 participation.

276 Our findings indicate a high levels of depression severity using the PHQ-9. We found
277 that one quarter of the professional Counter-Strike sample reported moderately severe (15.7%)
278 and severe (9.8%) symptoms of depression. Expert consensus guidelines have proposed treatment
279 action for moderately severe depression as pharmacotherapy and/or psychotherapy, whereas
280 individuals experiencing severe depression are recommended immediate pharmacotherapy and
281 if impairment persists, referred to a mental health specialist for psychotherapy (Cleare et al.,
282 2015). Our findings are substantially higher than those found in the general population. For
283 example, Qato et al. (2018) found 7.6% of a sample from the United States ($n = 26,192$) reported
284 moderately severe and severe depression as measured by the PHQ-9. Given the lack of literature
285 which has examined depression in both traditional sports athletes and esports athletes, it is
286 challenging to draw comparisons to our sample. Notwithstanding, research by Akersdotter et al.
287 (2019) using the PHQ-9 with Swedish elite traditional athletes found lower prevalence levels of
288 moderate (14.7%) and severe (3.6%) depression. Specifically, female depression severity was
289 higher (20.4% and 5.6%) for both moderate and severe depression when compared to males
290 (6.6% and 0.7%), respectively. Given that our sample was heavily weighted with males ($n = 48$,
291 94%), our findings highlight the seemingly high level of depression severity. To the author's
292 knowledge, our findings are the first to identify the prevalence of depressive symptoms within a
293 sample of professional esports athletes which highlights the importance of mental health support
294 provision at an organisational and individual level for Counter-Strike athletes.

295 Our findings also indicate a high prevalence of anxiety/depression and psychological
296 distress. We found that over three quarters (82.4%) of our sample reported symptoms of
297 anxiety/depression as measured by the GHQ-12, and over half our sample (54.9%) reported
298 psychological distress as measured by the distress screener. Recent research by Nochaiwong et
299 al. (2021) examining prevalence of mental ill health in the general population estimated rates of
300 anxiety (26.9%), depression (28%), and psychological distress (50%). Moreover, a systematic
301 review and meta-analysis of mental ill health in elite traditional sports athletes identified that
302 33.6% reported anxiety/depression and 19.6% reported distress (Gouttebarga et al., 2019). Our
303 findings therefore indicate seemingly high prevalence of anxiety/depressive symptoms and
304 psychological distress when compared to the general population and traditional sports athletes.
305 When compared to the esports literature, our findings also exceed reported anxiety (38%),
306 depression (37.1%), and psychological distress (22.2%) in FIFA competitors (Pereira et al.,
307 2021). Our findings therefore advance the dearth of research which has examined the prevalence

308 of mental ill health and mental wellbeing in esports. This further highlights the need for greater
309 examination of the mechanisms underlying potential mental ill health in professional Counter-
310 Strike athletes.

311 In addition to the high prevalence of mental ill health in our sample, our findings also
312 indicate low prevalence of mental wellbeing. Using the guidelines proposed by Fat et al. (2017),
313 72.5%, 15.7%, and 11.8% reported low, normal, and high mental wellbeing, respectively.
314 Although we lack ethnicity and nationality data of participants in the present study, due to the
315 need to protect anonymity, we found low levels of wellbeing in our sample ($M = 17.90$, $SD =$
316 7.64) when compared to the mean mental wellbeing score identified in Fat et al. (2017) in an
317 English sample of men ($M = 23.67$, $SD = 3.92$) and women ($M = 23.59$, $SD = 3.99$). To our
318 knowledge, these findings are the first to characterise and indicate the prevalence of mental
319 wellbeing states within professional Counter-Strike athletes.

320 To supplement our understanding, we asked whether our sample had been offered mental
321 health support by their current or former professional team(s) and the majority reported not being
322 offered support (No = 68.6%; Yes = 13%; Unsure 5.9%; No response = 12.5%). Although the
323 support experiences of our sample may elucidate the reasons underpinning the high mental ill
324 health and low mental wellbeing symptoms, we would like to highlight the possible shortcomings
325 of the single question asked in the present study. For example, it would have been prudent to ask
326 additional questions including “Have you ever thought about consulting a mental health
327 professional for mental ill health issues?” and “Do you know where to find mental health support
328 if you need it?”. Such information would help build a more accurate understanding of the
329 experiences of mental health support and advance our understanding of the mechanisms
330 underpinning mental health in professional esports athletes. Indeed, we encourage both
331 performance and clinically trained practitioners to use such questions to help provide effective
332 proactive and reactive interventions when supporting esports athletes.

333 The use of questionnaires, such as the PHQ-9, to case-find depression within primary
334 care is supported by the US Preventative Services Task Force (USPSTF) only when treatment
335 provisions are already in place (US Preventive Services Task Force, 2009). Moreover, the UK-
336 based National Institute for Health and Care Excellence (NICE) recommend the use of the
337 abbreviated PHQ-2 to facilitate early detection of depression in at-risk groups (National Institute
338 for Health and Care Excellence, 2022). Taken together with the prevalence of depressive
339 symptoms within our sample, this indicates the importance of reducing barriers in receiving
340 trained mental health support for Counter-Strike esports athletes (see Kegelaers et al., 2024 for a
341 discussion on mental health support in esports). This is particularly vital when considering that
342 early detection and treatment of depression is associated with a significantly better response to
343 treatment and higher rates of remission (Ghio et al., 2014). Further research is needed to

344 determine if esports athletes are at higher risk of developing symptoms of anxiety and/or
345 depression compared to the general public, and if there are game specific differences in
346 presentation, as there is evidence that targeted use of screening questionnaires to at-risk groups
347 provides greater clinical outcomes (Kessler et al., 2005; MaGPIe Research Group, 2005).

348 **Limitations, Future Research, and Practical Implications**

349 Although the present study has shed light on the prevalence of mental ill health and
350 mental wellbeing of professional Counter-Strike athletes it is not without its limitations. Owing
351 to the constraints imposed by our ethical approval and adherence to data protection policies, we
352 were mandated to employ Qualtrics for our online survey, limiting our ability to counterbalance
353 the order of distributed questionnaires. Despite this limitation, our data collection procedure
354 adhered to established practices in prior literature, and we took deliberate measures to minimise
355 participant burden, as evidenced by an average completion time of 14 minutes. It is worth noting
356 that literature has indicated a decline in vigilance after tasks of significantly greater durations
357 (e.g., Sharpe et al., 2023), hence we are confident that our participants did not experience fatigue
358 during the survey, thereby mitigating any potential negative impact on the data's rigor. It is also
359 important to highlight that our data were collected January to June 2022. Given that pandemic
360 restrictions generally eased globally during this time, it could be argued that the pandemic may
361 have had a limited impact on participant mental ill health and mental wellbeing. Indeed, research
362 (e.g., DiFrancisco-Donoghe et al., 2023) has suggested that gamers may have managed
363 challenges experienced during the pandemic better than the general population due to easier
364 accessibility to social activities that align to their pre-pandemic lifestyle (e.g., social support via
365 gameplay). However, we do concede that the impact of the pandemic on mental health and mental
366 wellbeing cannot be dismissed, and further research is required.

367 We encourage future research to replicate the present study by representing gender (e.g.,
368 Rogstad, 2022), individual differences (e.g., Birch et al., 2023), expertise (Murphy et al., 2020),
369 and athletes from different esports titles (Griffiths & Sharpe, 2024) to advance our understanding
370 of mental health prevalence in professional esports athletes. Previous research by Smith et al.
371 (2022) identified stressors, sleep, burnout, and social phobia to predict mental ill health in a
372 university-based sample of first-person shooter esports competitors. Research is therefore
373 required to elucidate the precipitants (i.e., risk factors) underlying mental ill health in professional
374 esports athletes. The inclusion of demographic information (e.g., hours played, time with coach,
375 time with teammates, prize pool) may enable researchers to perform more complex analyses (e.g.,
376 path analysis) to better understand the diverse variables which may positively and/or negatively
377 impact mental ill health. For example, the phenomenon of problematic gaming has been
378 empirically linked to a diverse array of adverse health-related consequences (see Männikkö et
379 al., 2020 for a review and meta-analysis).

380 Our findings offer a range of implications for both practice and future research. Previous
381 research studies examining traditional sports athletes has tended to use instruments to either
382 measure mental ill health (e.g., Akesdotter et al., 2020) or mental wellbeing (e.g., Grimson et al.,
383 2023), with only a small number harnessing both (e.g., Nicholls et al., 2020). Research adopting
384 both clinical and non-clinical measures may not only advance our understanding of the
385 prevalence of mental ill health in esports, but also advance understanding of mental ill health in
386 other performance contexts. However, it must be highlighted that the use of clinical assessment
387 tools such as the PHQ-9 requires professional training for both implementation and interpretation.
388 Given that Kroenke et al. (2001) states that the PHQ-9 should only be administered by trained
389 professionals, we collaborated with author AA who is a trained psychiatric physician. However,
390 we appreciate that few researchers and practitioners will be qualified to appropriately administer
391 and interpret the PHQ-9. Nonetheless, we encourage clinical practitioners to harness validated
392 clinical tools such as the PHQ-9 to better understand the prevalence and severity of mental ill
393 health in esports. Alternatively, the SWEBWBS provides a quick and easy to use measure of
394 mental wellbeing which affords a single summary score for comparisons across different
395 populations and settings (Stewart-Brown et al., 2009). Indeed, higher wellbeing is extensively
396 evidenced as being protective of mental health disorders such as depression and anxiety (Grant
397 et al., 2013; Keyes et al., 2010). Therefore, the SWEMWBS could be a useful instrument for both
398 researchers and practitioners seeking to longitudinally examine and support positive psychology
399 in esports competitors and beyond. Indeed, the SWEMWBS may provide sport and exercise
400 psychologists with means to assess wellbeing which may act as a preventative strategy to support
401 players, whereby more severe cases can then be referred to a clinical psychologist if necessary.
402 Given that the literature in traditional sports (e.g., Henriksen et al. 2020; Reardon et al., 2019)
403 and esports (e.g., Leis et al., 2022; Poulus et al., 2022; Smith et al., 2019) have highlighted the
404 demands placed on athletes (e.g., high training loads, competition stress, team issues, life outside
405 of competing), we encourage practitioners to be vigilant of these risk factors when supporting the
406 mental health of professional esports athletes. We hope that esports-specific mental health referral
407 pathways can be established to facilitate the development and sustainability of esports. We
408 encourage esports organisations to employ sport and exercise psychologists and/or coaches with
409 mental health first aid training to provide the first line of mental health support to promote
410 flourishing in esports (Keyes, 2002).

411 **Conclusion**

412 Our study provides a unique contribution to the literature by offering the first study to
413 examine the prevalence of mental ill health and mental wellbeing of professional Counter-Strike
414 athletes. We found that one quarter reported moderately severe (15.7%) and severe (9.8%)
415 depression, over 75% reported anxiety/depression, over half (54.9%) reported psychological

416 distress, and nearly three quarters (72.5%) reported low mental wellbeing. Despite these
417 concerning findings, only 13% of our sample reported being offered mental health support by
418 their current or former professional team(s). We highlight the need to advance our understanding
419 of mental ill health and mental wellbeing in professional Counter-Strike. Our findings suggest
420 that greater importance should be placed on screening and intervention support by both
421 performance and clinically trained practitioners to facilitate mental health within the esports
422 ecosystem.

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Table 1

Absolute values and relative percentages of prevalence for mental ill health and mental wellbeing.

Measure	<i>n</i>	%
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PHQ-9		
None (score 0-4)	18	35.29
Mild (score 5-9)	11	21.57
Moderate (score 10-14)	9	17.65
Moderately-severe (15-19)	8	15.69
Severe (≥ 20)	5	9.80
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GHQ-12 (score >2)	42	82.35
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DS (score ≥ 4)	28	54.90
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SWEMWBS		
Low wellbeing (score 7-19.3)	37	72.55
Normal wellbeing (score 20.0-27.0)	8	15.69
High wellbeing (score 28.1-35)	6	11.76
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Note. PHQ-9 = Patient Health Questionnaire-9; GHQ-12 = General Health Questionnaire—short form-12; DS = Distress Screener; SWEMWBS = Short Warwick–Edinburgh Mental Well-Being Scale.

Table 2

Prevalence means, standard deviations and confidence intervals for mental ill health and mental wellbeing.

Measure	<i>M</i>	<i>SD</i>	95% CI	
			<i>LL</i>	<i>UL</i>
PHQ-9	9.18	7.26	7.19	11.20
GHQ-12	4.59	2.67	3.86	5.32
DS	3.51	1.97	2.97	4.05
SWEMWBS	17.90	7.64	15.80	20.00

Note. *M* = Mean; *SD* = Standard deviation; *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit.