

1 **Knowledge of and Experience with Transgender Players among Soccer Team Staff:**

2 **A Cross-sectional Questionnaire Design**

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17

18 **Abstract**

19 **Background:** Transgender issues have become more prominent in sports. However,
20 knowledge of and experience with supporting transgender players across soccer team staff
21 remain unclear. This study surveyed soccer team staff in Japan and aimed to 1) evaluate
22 staff's level of knowledge of transgender-related terminology, 2) ascertain staff's ability to
23 identify transgender players and their experience in supporting transgender players, and 3)
24 identify factors which affect staff's knowledge and experience.

25 **Methods:** A questionnaire was disbursed to coaches, physicians, and physical trainers
26 affiliated with soccer teams between 2018 and 2019. Questions asked about 1) participant
27 characteristics (sex, age, certified license, team categories); 2) understanding of
28 transgender related terms, including LGBT (lesbian, gay, bisexual, and transgender), and
29 the IOC Consensus Meeting on Sex Reassignment and Hyperandrogenism (IOC
30 Consensus Meeting 2015); 3) ability to identify transgender players; and 4) experience in
31 supporting transgender players.

32 **Results:** In total, 478 participants were analyzed, including 30 women, 448 men, and none
33 of the other genders. The mean age of participants was 38 ± 10 years; 443 (93%) were
34 involved in men's soccer and 105 (22%) were involved in women's soccer. While 358 (75%)
35 and 398 (83%) participants understood the terms LGBT and transgender, only 33 (7%) were

36 familiar with the IOC Consensus Meeting 2015. Only 70 (15%) participants could identify
37 transgender players, and 6 (2%) had experiences supporting them. Moreover, 4 (1%) had
38 witnessed transgender players receiving cross-sex hormone treatment.

39 **Conclusion:** Although a considerable proportion of soccer support staff were familiar with
40 transgender terms, most did not have sufficient knowledge or experience with transgender
41 athletes.

42 **Keywords:** gender identity, sexual and gender minorities, health services for transgender
43 persons, LGBTQ athletes, soccer

44 **Keypoints:**

45 • There are an increasing number of athletes who identify as transgender. Increasingly,
46 sports have been recognized to elicit mental and physical benefits in participating
47 transgender individuals.

48 • The inclusion of transgender athletes may require additional medical and environmental
49 considerations, particularly within competitive sports. The majority of athletic support staff in
50 our study understood the terms LGBT and transgender. However, only 15% of participants
51 reported knowing of a transgender player, and most participants did not have sufficient
52 knowledge or experience supporting transgender athletes.

53 · Based on the lack of soccer staff experience supporting transgender athletes, and
54 documented success in other settings, an educational training program would prove useful
55 for broadening the capabilities of soccer staff in identifying, providing treatment, counselling
56 and other forms of support to transgender athletes.

57

58

59 **Background**

60 The term transgender refers to individuals whose gender identity or gender expression
61 deviates from their assigned sex at birth.⁸ The estimated prevalence of transgender persons
62 in the general population varies across reports, ranging from 4-8/100,000 in Japan to
63 355-390/100,000 adults in the United States.^{1,3,10} Moreover, there are an increasing number
64 of athletes who identify as transgender⁸ although the exact prevalence remains unclear.¹

65 Increasingly, sports have been recognized to elicit mental and physical benefits in
66 participating transgender individuals.⁸ However, the inclusion of transgender athletes may
67 require additional medical and environmental considerations, particularly within competitive
68 sports.¹³ First, testosterone is commonly used as a cross-sex hormone treatment to facilitate
69 a female-to-male transition, but could also compromise the fairness of competition, and may
70 be regarded as illegal doping due to its anabolic effects.^{1,8} Second, transgender athletes
71 should have access to facilities, such as locker rooms and other team spaces, that match
72 their gender identities.¹⁵ Accordingly, sports organizations are placing an increased
73 emphasis on recognizing, including, and supporting transgender athletes.¹⁶ However, some
74 transgender athletes feel dissonance due to the unfair advantage accorded by
75 testosterone.¹⁷ Moreover, they may also be negatively impacted by their teams, such as
76 through discrimination or harassment.¹⁷ In this regard, athletic professionals, including

77 sports team staff, can play a significant role in promoting an inclusive and supportive
78 environment.^{13,16}

79 Studies have shown that medical providers and athletic trainers¹³ may lack knowledge of
80 transgender issues in athletes. As a result, athletic professionals may be ill-equipped to
81 support transgender athletes or adequately address their medical needs.¹³ To evaluate the
82 awareness of transgender issues within the medical community,^{6,7,11,14,18} one study reported
83 on the rate of knowledge of transgender-related terminologies, such as “transgender” and
84 “LGBT (Lesbian, gay, bisexual, and transgender),” in medical students and healthcare
85 workers.¹² However, similar studies have not been performed with sports team staff.

86 The International Olympic Committee (IOC) Consensus Meeting on Sex Reassignment
87 and Hyperandrogenism November 2015 (IOC Consensus 2015)¹⁹ established a core set of
88 terms that sports team staff should understand. The IOC further established eligibility
89 guidelines for athletes with respect to serum testosterone level and sex reassignment
90 surgery. This policy attempted to eliminate any unfair advantage afforded by the use of
91 testosterone while also maximizing the opportunity for transgender athletes to participate.
92 Studies conducted in 2008 and 2010 assessed the level of knowledge possessed by sports
93 staff regarding the IOC Statement of the Stockholm Consensus on Sex Reassignment in
94 Sports,²⁰ the predecessor to the IOC Consensus 2015^{19,21}. However, to date, no study has

95 evaluated the level of such knowledge in soccer team staff.

96 Data regarding staff ability to identify transgender athletes and the level of experience in
97 supporting transgender athletes, would help in understanding the barriers faced by
98 transgender athletes in sports.^{12,13,17} Moreover, such information would support the
99 development of an inclusive and fair environment within competitive sports.

100 As a result, this study surveyed soccer team staff in Japan and aimed to 1) evaluate the
101 staff's level of knowledge of transgender-related terminology,¹² 2) their ability to identify
102 transgender players and their experience in supporting them,^{4,11} and 3) identify factors
103 which affect staff's knowledge and experience.¹² We chose to study soccer team staff,
104 because soccer is one of the most popular team sports in Japan, and worldwide, which
105 made it easier to recruit a large number of participants.

106

107 **Methods**

108 **Participants**

109 This cross-sectional, questionnaire-based study was conducted between October 2018 and
110 June 2019. We included all coaches, physicians, and physical trainers involved with
111 soccer teams who attended 11 technical or medical meetings organized by the Japanese
112 Football Association during the study period. Participants who incompletely answered the

113 questionnaire were excluded from the analysis. No identifying information was requested
114 from participants to ensure that the study remained anonymous. Questionnaires were
115 provided to all meeting participants, which they completed during 15 minutes break times
116 between sessions. The Research Ethics Committee of the Graduate School of Medicine,
117 Chiba University, approved this study (Ethics Committee reference number: 3010). All
118 participants provided written informed consent.

119

120 **Questionnaire**

121 The questionnaire consisted of 22 questions, including five questions on participant
122 characteristics, three on participants' knowledge of transgender-related terms, and 14 on
123 recognizing the need to, and experience with, supporting transgender players.

124 Participant characteristics included age, gender (female, male, and others), and
125 profession (coach, physician, and physical trainer). In line with Tanaka²², who noted that
126 there was a discrepancy of transgender knowledge between older and younger people, the
127 age of participants was dichotomized into older (\geq mean age) and younger ($<$ mean age)
128 groups for statistical analysis. We further recorded participant's certification, including the
129 Japanese Football Association coach license; the sports physician license, as certified by
130 the Japanese Sport Association, or the Japanese Orthopaedic Association; and the certified

131 physical trainer license, issued by either the Japanese Sport Association, or the American
132 National Athletic Trainers' Association.²³ Additionally, responses to the categories of teams
133 that participants were actively involved with (women's soccer, futsal, and men's soccer,
134 futsal, beach soccer, allowing for multiple choices) were classified into "women's team
135 (those who support at least one women's team)" and "only men's team" (those who support
136 only men's team), for statistical analysis. Responses for the age categories of teams they
137 were involved with (elementary school and younger, junior high school, high school,
138 university, and adult) were dichotomized into "only younger teams" (those who support only
139 teams of junior high school or younger) and "older teams" (those who support at least one
140 team of high school or older). This cutoff was determined based on the diagnostic and
141 therapeutic guidelines for patients with gender identity disorder 4th edition⁹ which states that
142 in Japan, transgender persons can begin their cross-sex hormone treatment during their late
143 teenage years. However, the policy of the Fédération Internationale de Football Association
144 is to only conduct doping tests for soccer athletes in over 17-year-old categories.

145 To assess knowledge of transgender-related terminology, we asked whether participants
146 understood the following three terms: 1) LGBT (lesbian, gay, bisexual, and transgender),^{12,18}
147 2) transgender,^{12,18} and 3) the IOC Consensus Meeting 2015.²¹ Answers for each term were
148 recorded as "yes," "no," or "I have heard of, but do not know the meaning," and for analysis,

149 these answers were recategorized as “yes” and “no/not sure” in line with Hisaka’s report.²⁴

150 After defining transgender, participants were asked to answer 10 questions on recognizing
151 transgender players, as in the ability to point out who is transgender and who is not (Table 4).
152 These questions were created based on a previous report of LGBT dental school students,¹¹
153 as well as input from the IOC consensus meeting 2015 report, and experts who provided
154 insights on answers which were relevant to transgender athletes. Experts included coaches,
155 physicians, physical trainers, sports lawyers, and sociologists. We also surveyed
156 transgender athletes on their opinions of treatments (cross-sex hormone treatment, sex
157 reassignment surgery), doping, and activities supportive of their daily living,¹¹ which would
158 be important to the broader population of transgender athletes.

159 An initial survey was administered via a pilot study to select answer options, and to refine
160 questions. The final version of this questionnaire was subsequently used for data collection
161 in a larger sample. Additional questions included whether participants had identified
162 someone as transgender in the teams they supported (female-to-male players in women’s
163 teams and male-to-female players in men’s team) and whether such players had undergone
164 cross-sex hormone treatment and sex reassignment surgery^{11,15} (Table 4). Answers
165 included “yes,” “no,” or “not sure.” The question details are shown in Table 4. Furthermore,
166 participants were asked four questions on their experience with supporting transgender

167 players⁴ (Table 5). These questions asked whether participants had experience with
168 supporting players on transgender issues, and also asked the details of such support.
169 Additional questions included whether the participants' team or school had facilities to
170 support transgender athletes^{4,11} (Table 5). The question details are shown in Table 5.

171

172 **Statistics**

173 Categorical data (patient characteristics, knowledge of transgender-related terminology,
174 recognition of transgender players, experience with supporting transgender players) were
175 expressed by their frequency and percentage, while continuous data were represented by
176 their mean and standard deviation. Univariate associations between the knowledge of
177 transgender-related terminology and participant characteristics were assessed using
178 chi-square tests and via residual analysis post-hoc, to assess multiple comparisons. The
179 age of the team category was excluded from analysis because the majority ($n = 460$, 96%)
180 of participants were categorized as being in an older team.

181 After univariate logistic regression analysis, multivariable logistic regression analyses
182 were performed to explore independent associations, in which knowledge of
183 transgender-related terminology was the objective variable and the associated factors that
184 showed significant associations in the univariate analysis with a $P < 0.1$ were the

185 explanatory variables. Participant characteristics (participants' gender and profession, older
186 or younger groups, certified license, and sex category of the team) were entered as the
187 independent variable regardless of their significance. Stepwise regression with degrees of
188 freedom of 1, a cut-off value of $P < 0.2$ was employed to select variables for the final
189 regression model, of which statistical significance was set at $P < 0.05$. Similarly,
190 associations between identifying transgender players and participant characteristics were
191 assessed using univariate and multivariate analyses. Statistical analyses were performed
192 using JMP 11.2.1 (SAS Institute Inc., Cary, NY, USA).

193

194 **Results**

195 **Participant Characteristics**

196 Of 512 attendees who attended all 11 meetings, 28 attendees refused to participate in this
197 survey. Six attendees were excluded for not being involved with soccer players at the time of
198 the survey. Data from the remaining 478 attendees, including 119 (25%) coaches, 156
199 (33%) physicians, and 203 (42%) physical trainers, were used in our analysis (Table 1). In
200 total, we evaluated 30 (6%) female, 448 (94%) male, and 0 (0%) others, with a mean age of
201 38 ± 10 years. Overall, 383 (80%) participants had certified licenses, 105 (22%) worked with
202 women's sports team, and 460 (96%) worked with teams with an age-bracket \geq high school.

203

204 **Knowledge of Transgender-Related Terminologies**

205 Overall 358 (75%) and 398 (83%) participants understood the terms “LGBT” and
206 “transgender,” respectively (Table 2). However, only 33 (7%) were familiar with the IOC
207 Consensus Meeting 2015.

208 In univariate analysis, knowledge of LGBT was proportionately higher in females and
209 physicians than in coaches and physical trainers ($P = 0.04$, $P < 0.01$, Table 2). Knowledge of
210 transgender was also higher in physicians and participants without a certified license, and
211 participants who worked with women’s team ($P < 0.01$, $P = 0.03$, $P = 0.03$, Table 2).
212 Similarly, in the older group, physicians and participants who worked with women’s teams,
213 also had greater levels of knowledge of transgender and the IOC Consensus 2015¹⁹ ($P <$
214 0.01 , $P < 0.01$, $P < 0.01$, Table 2).

215 When disaggregated by age, while no statistically significant differences were found in
216 the knowledge of LGBT, or transgender, older participants had statistically greater levels of
217 knowledge on the IOC consensus meeting 2015. Across all transgender-related terms, there
218 were statistically significant differences in knowledge between professions, with physicians
219 demonstrating the highest levels of knowledge ($P < 0.01$) (Table 2). Similarly, multivariable
220 logistic regression analysis showed that physicians possessed a greater knowledge of

221 LGBT and transgender terms compared to others (LGBT; $P < 0.01$, odds ratio [95%
222 confidence interval]; 3.14 [1.72-5.73] (compared to coaches), $P < 0.01$, odds ratio [95%
223 confidence interval]; 2.50 [1.41-4.43] (compared to physical trainers), transgender; $P < 0.01$,
224 odds ratio [95% confidence interval]; 3.29 [1.49-7.25] (compared to coaches), $P < 0.01$,
225 odds ratio [95% confidence interval]; 3.97 [1.91-8.26] (compared to physical trainers). In
226 addition, multivariable logistic regression analysis showed that those who worked with
227 female teams possessed a greater knowledge of the IOC consensus meeting 2015
228 compared to those who supported men's only teams ($P < 0.01$, odds ratio [95% confidence
229 interval]; 3.48 [1.62-7.47]).

230

231 **Identification of and Experience Supporting Transgender Players**

232 A total of 70 (15%) participants, including 20 coaches, 16 physicians, and 34 physical
233 trainers, indicated that they could identify transgender players in the teams they worked with
234 (Table 3). Of these 70 participants, 32 indicated they worked with two or more players
235 (Table 4). Thus, a total of 95 female-to-male players and 12 male-to-female players were
236 identified, of which, 92 played in high school or older age-bracket teams (Table 4).

237 In univariate analysis, female participants ($P < 0.01$), participants with certified licenses
238 ($P < 0.01$), and those who worked with female teams ($P < 0.01$) were more likely to

239 recognize transgender players (Table 3). Multivariable logistic regression analysis showed
240 that participants with certified licenses ($P < 0.01$, odds ratio [95% confidence interval]; 3.80
241 [1.57-11.4]) and who worked with female teams were more likely to recognize transgender
242 players ($P < 0.01$, odds ratio [95% confidence interval]; 5.29 [2.91-9.64]).

243 Four (1%) participants, including 2 physicians and 2 physical trainers, witnessed active
244 transgender players who had received cross-sex hormone treatment (Table 4). Additionally,
245 2 participants (1 coach and 1 physician) reported that they knew of players who retired to
246 undergo cross-sex hormone therapy (Table 4). Similarly, 11 participants (3 coaches, 1
247 physician and 7 physical trainers) knew of active and retired players who received sex
248 reassignment surgery (Table 4).

249 Of the 478 participants, 6 (1%) participants, including 2 coaches, 2 physicians, and 2
250 physical trainers, had experience with directly supporting a player with transgender-related
251 issues (Table 5). Consultations were conducted on treatment ($n = 3$), relationships with
252 teammates, family, and friends ($n = 4$), changing their name ($n = 1$), and going to the
253 hospital ($n = 1$). Some teams and schools possessed support services and school
254 counselors ($n = 11$). Others contained school nurses and educational advisers ($n = 4$).

255 **Discussion**

256 In this study, 75% and 83% of soccer team staff understood the terms “LGBT” and
257 “transgender,” respectively. Previously, a survey of Canadian medical students conducted in
258 2017,¹² indicated that 66% and 91% of students were confident in defining “LGBT” and
259 “transgender,” respectively. In an internet survey of the general population in Japan
260 conducted by Dentsu Inc., a Japanese advertising agency, 69% of responders had
261 previously heard of the term “LGBT”.²⁵ Another Japanese internet survey conducted in 2017,
262 indicates that 69% of sports instructors registered with the Japanese Sports Association in
263 2017 had previously heard the term “LGBT”.²³ Thus our results for assessing knowledge of
264 LGBT terms are consistent with previous surveys.

265 A previous report showed that school education programs were effective in improving
266 knowledge of LGBT issues.^{6,18} However, training courses for certifying coaches, physicians,
267 and physical trainers do not incorporate knowledge of transgender issues.¹³ Incorporating a
268 transgender educational program into training courses would further improve the knowledge
269 of transgender issues across team staff.¹³

270 We showed that only 7% of participants were aware of the IOC consensus 2015 meeting.
271 ¹⁹ This low value is consistent with a previous study that found that only 3% of sports
272 physicians knew the IOC Statement of the Stockholm Consensus on Sex Reassignment in
273 Sports,²⁰ the predecessor to the IOC Consensus 2015,¹⁹ in 2008 and 2010.²¹

274 Currently, there are few opportunities to learn about LGBT, and in-depth transgender
275 issues in schools and on sports fields. The current curriculum for sports or soccer certified
276 licenses does not discuss LGBT topics. As well, there is no consensus on the eligibility of
277 transgender athletes for participating in competitive sports. Indeed, only a few international
278 sports federations have a clear rule.⁸ The IOC consensus 2015¹⁹ represents a basic
279 guideline from which suitable regulation for each sport can be based. Athletes, athletic
280 professions, and team staff, should understand and follow such guidelines, in order to avoid
281 unfair sports participation.²⁶ Moreover, education is needed to increase knowledge of
282 transgender issues.^{6,13,18}

283 Multivariable logistic regression analysis indicated that knowledge of LGBT and
284 transgender terms were higher in physicians than in coaches and physical trainers (LGBT; P
285 < 0.01 , odds ratio [95% confidence interval]; 3.14 [1.72-5.73] (compared to coaches), P $<$
286 0.01 , odds ratio [95% confidence interval]; 2.50 [1.41-4.43] (compared to physical trainers),
287 transgender; P < 0.01 , odds ratio [95% confidence interval]; 3.29 [1.49-7.25] (compared to
288 coaches), P < 0.01 , odds ratio [95% confidence interval]; 3.97 [1.91-8.26] (compared to
289 physical trainers). To the best of our knowledge, no previous reports have compared the
290 level of knowledge of transgender-related terms across various athletic professionals. Only
291 10% of athletic trainers in America received formal training on the needs of transgender

292 athletes.¹³ Many studies have surveyed curriculums regarding sexual minorities in college
293 medical departments and indicate that physicians and medical students are willing to
294 increase their knowledge of transgender issues.^{2,7,12,14} Therefore, it is plausible that
295 physicians have a greater understanding of transgender-related terms than coaches and
296 physical trainers.

297 Multivariable logistic regression also showed that knowledge of the IOC consensus
298 2015¹⁹ was higher among those who worked with female teams than those who support only
299 men's team ($P < 0.01$, odds ratio [95% confidence interval]; 3.48 [1.62-7.47]). To the best of
300 our knowledge, no previous reports have compared differences in the level of knowledge of
301 the IOC consensus 2015¹⁹ across athletic professions. Therefore, the reason that those who
302 supported the women categories had higher knowledge of the IOC consensus 2015¹⁹ is not
303 clear. However, it seems that having more experience and working with teams of women,
304 which may have more transgender players, may have enhanced knowledge of the IOC
305 consensus 2015.¹⁹ Indeed, Ceccacci reported that persons who have had experiences and
306 interpersonal contacts with transgenders tended to have positive attitudes towards
307 transgender issues.²⁷

308 This study found that about 1 out of 7 team staff self-reported that they could identify a
309 transgender player through his/her services as athletic staff. Most of these transgender

310 players (95 out of 107) were female-to-male players in women's teams. Multivariable logistic
311 regression analysis also showed that participants with certified licenses and who worked
312 with women's teams were more likely to be able to identify a transgender player ($P < 0.01$,
313 odds ratio [95% confidence interval]; 3.80 [1.57-11.4]), $P < 0.01$, odds ratio [95% confidence
314 interval]; 5.29 [2.91-9.64]). The number of transgender athletes in sports has not been
315 studied. We cannot know whether these results are valid. It is important to recognize that the
316 number of transgender players identified by staff in this study does not represent the
317 prevalence of transgender players. It is interesting to note that 95 out of 107 transgender
318 players were female-to-male players who belonged to women's teams, however, we stress
319 that our results do not definitively confirm this. Our results are consistent with a previous
320 report which determined that the prevalence of female-to-male transgender persons may be
321 higher than male-to-female transgender persons in the general population in Japan.¹ Our
322 results on the number of identified transgender athletes is clinically relevant, because the
323 low frequency of identified transgender athletes indicates that support staff may lack
324 knowledge of transgender issues, which precludes the implementation of inclusive
325 supports.^{14,16}

326 That participants with certified licenses and who worked with women's teams identified
327 more transgender athletes could be related to experience. Through certification and

328 experience, staff will have studied how to better treat soccer players and will have greater
329 levels of experience with supporting soccer players in general. This greater level of
330 experience may also help such staff in diverse populations of athletes. Thus, it is plausible
331 that staff with certified licenses, through their increased training and experience, were better
332 able to identify transgender players. This interpretation is supported by prior studies that
333 LGBT people remain unseen or unheard consciously or unconsciously by others due to a
334 lack of knowledge of LGBT issues.² Moreover, exposure to diversity is important for
335 supporting LGBT.²⁷ Thus, our results imply that through more knowledge and training,
336 athletic professionals can be better equipped to identify transgender players and provide
337 adequate support.²

338 Moreover, 1% of participants knew of a transgender player who received cross-sex
339 hormone treatment. We did not survey specific information about the players, for example,
340 which team the players belonged to or whether these transgender players received
341 treatment from professionals. However, if they had received cross-sex hormone treatment
342 before retiring, they would have had to abide by the IOC cross-sex hormone treatment
343 regulations. In total, only 6 participants (2 coaches (0.4 %), 2 physicians (0.4 %), 2 physical
344 trainers (0.4 %)) had experiences with supporting transgender players with respect to their
345 lives or treatment. It is very important to support transgenders with accessing treatment,

346 their mentality, and daily interactions with other players.⁸ Schools allow transgender
347 students to use the bathroom that matches their gender identity.¹⁵ Likewise, similar to
348 schools, in order to create a comfortable climate that prevents discrimination and
349 harassment, athletic professionals have a responsibility to educate themselves on
350 transgender issues and to support transgender athletes.^{2,5,7,8} Grant reported that 50% of
351 transgender persons indicated that they had to teach their medical providers about
352 transgender care.²⁸ A survey of transgender men in Los Angeles showed that more than half
353 of the participants had been denied healthcare services because of their gender.²⁹ When
354 they did receive healthcare, more than two-thirds were not satisfied with the healthcare
355 workers' knowledge of transgender issues.²⁹ This theme is consistent with earlier research¹³
356 which showed that health care professionals were not necessarily familiar with the
357 terminology or distinctions. This lack of experience often led to unhelpful, uncomfortable,
358 and even hostile treatment experiences for the patient.¹³

359 This study has several limitations. First, each participant's knowledge of
360 transgender-related terminology was self-reported. It is possible that participants may be
361 incorrect in their assertions of knowledge. Whether a participant could identify transgender
362 players through their work, was, again, self-reported. Therefore, it is possible that many
363 identified players were not transgender players. Second, as we generated questions to

364 evaluate participants' experience with supporting transgender players, it is possible that
365 respondents felt pressure to report on supporting a transgender player, when in fact they
366 had not.

367

368 **Conclusion**

369 The majority of athletic support staff in our study understood the terms LGBT and
370 transgender. However, only 15% of participants reported knowing of a transgender player,
371 and most participants did not have sufficient knowledge or experience supporting
372 transgender athletes. An education program is necessary to provide appropriate and
373 systematic support for transgender soccer players.

374 **Abbreviations**

375 IOC: The International Olympic Committee; IOC Consensus 2015: The International
376 Olympic Committee (IOC) Consensus Meeting on Sex Reassignment and
377 Hyperandrogenism November 2015; LGBT: Lesbian, gay, bisexual, and transgender

378

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385

386 **Availability of Data and Materials Data sharing**

387 The datasets used and/or analysed during the current study are available from the

388 corresponding author on reasonable request.

389

390 **Authors' Contributions**

391 All authors contributed significantly in the editing, synthesis, proof reading, and revising

392 process of this manuscript. All authors read and approved the final manuscript.

393

394 **Ethics Approval and Consent to Participate**

395 The Research Ethics Committee of the Graduate School of Medicine, Chiba University,

396 approved this study (Ethics Committee reference number: 3010).

397

398 **Consent for Publication**

399 All participants provided written informed consent.

400

401 **Competing Interests**

402 All authors declare that they have no competing interests.

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479

480 **TABLES**

481 Table 1. Participant characteristics (n = 478).

482 Values show the number (%) of participant unless otherwise indicated. *Mean ± standard
483 deviation. **Multiple choices allowed.

484

485 Table 2. Association between the knowledge of the transgender-related terms and
486 participant characteristics (n = 478).

487 *Chi-square tests. Values show the number (%) of participants who answered 'yes'.

488

489 Table 3. Association between recognition of transgender players and participant
490 characteristics (n = 70).

491 *Chi-square tests. Values show the number (%) of participants who answered 'yes'.

492

493 Table 4. Recognition of transgender soccer players (n = 478, n=70).

494 Values show the number (%) of participant unless otherwise indicated. *n = 478.

495 **Female-to-male players in women's teams and male-to-female players in men's teams.

496 ***Multiple choices allowed.

497

498 Table 5. Experience to support transgender players (n = 478).

499 *Multiple choices allowed.