Knowledge of and experience with transgender players among soccer team staff: a cross-sectional questionnaire design

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ABSTRACT

Objectives: Transgender issues have become increasingly prominent in sports. However, knowledge of and experience with supporting transgender players across soccer team staff remain unclear. The objectives of this questionnaire-based study were to 1) clarify staff knowledge of transgender-related terminology; and 2) explore soccer team staff’s awareness and experience with supporting transgender players.

Methods: A questionnaire was distributed to coaches, physicians, and physical trainers affiliated with soccer teams between 2018 and 2019 to capture 1) participant characteristics (e.g. gender, age, certified license, team categories); 2) their understanding of transgender-related terms, including lesbian, gay, bisexual, and transgender (LGBT) and of the IOC Consensus Meeting on Sex Reassignment and Hyperandrogenism in 2015; 3) their awareness of transgender players; and 4) their experience supporting transgender players. Participants were categorized by age, gender, profession, qualifications, and category of involvement; their understanding and experience were investigated statistically using univariate and multivariate analysis.

Results: The 478 respondents included 30 women and 448 men with a mean age of 38 ± 10 years. Of these, 83% understood the term transgender, 75% understood the term LGBT, while only 7% were familiar with the 2015 IOC Consensus Meeting. Physicians reflected more knowledge than coaches and physical trainers (p < 0.01). Altogether, 15% had identified transgender players and 1% had experience supporting them. Respondents with certified licenses who worked with women’s teams were more likely to recognize transgender players (p < 0.01). Four participants (1%) had witnessed transgender players receiving transgender hormone therapy.

Conclusion: Although most soccer support staff were familiar with transgender terms, many did not have sufficient knowledge of experience with transgender athletes.

Introduction

Transgender individuals feel and experience an incongruence between the sex they were assigned at birth and their gender identity [1]. The estimated prevalence of transgender persons in the general population varies across reports, ranging from 4–8/100,000 adults in Japan to 355–390/100,000 adults in the United States [2–4]. Moreover, though an increasing number of athletes identify as transgender [1], the exact prevalence remains unclear [2].

Sports have been increasingly recognized to elicit mental and physical benefits among transgender individuals [1]. However, the inclusion of transgender athletes may require additional medical and environmental considerations, particularly within competitive sports [5]. First, though testosterone is commonly used in transgender hormone therapy to facilitate a female-to-male transition, it could also compromise the fairness of competition and may be regarded as illegal doping due to its anabolic effects [1,2]. Second, transgender athletes should have access to facilities, such as locker rooms and other team spaces that match their gender identities [6]. Accordingly, sports organizations are placing an increased emphasis on recognizing, including, and supporting transgender athletes [7]. However, such athletes may be negatively impacted even through team discrimination or harassment [8]. In this regard, athletic professionals, including sports team staff, can play a critical role in promoting an inclusive and supportive environment [5,7].

One study has shown that medical providers and physical trainers [5] may lack knowledge of transgender issues in athletes. As a result, athletic professionals may be ill-equipped to support transgender athletes or adequately address their medical needs [5]. Other studies have evaluated the awareness of transgender issues within the medical community [9–13], with one [14] reporting a low rate of knowledge of transgender-related terminologies, such as ‘transgender’ and ‘LGBT (Lesbian, gay, bisexual, and transgender),’ among medical students and healthcare workers. However, similar studies have not been conducted among sports team staff.
The International Olympic Committee (IOC) Consensus Meeting on Sex Reassignment and Hyperandrogenism November 2015 (IOC Consensus 2015) [15] established a core set of terms that sports team staff should understand. The IOC further established eligibility guidelines for athletes with respect to serum testosterone level and gender affirming surgery. This policy attempted to eliminate any unfair advantage afforded by the use of testosterone while also maximizing the opportunity for transgender athletes to participate. A study [16] surveyed sports staff in 2008 and 2010 regarding their knowledge of the Statement of the Stockholm Consensus on Sex Reassignment in Sports [17], the predecessor to the IOC Consensus 2015 [15]. Fifty-eight organizations, including member organizations of the Japanese Olympic Committee, the Japan High Performance Sport Center, and the Japanese Para-Sports Association participated with the medical committee members of each organization or the association president responding to the survey. The results showed that 8.3% in 2008 and 2.9% in 2010 of the respondents were ‘familiar’ with the Stockholm Consensus on Sex Reassignment in Sports in detail, 38.9% in 2008 and 26.5% in 2010 had heard of it, and 52.8% in 2008 and 64.7% in 2010 responded that they had not heard of it [16]. To date, no research has examined the knowledge of the recently established IOC Consensus in 2015.

Data regarding staff’s awareness of transgender athletes and the level of experience in supporting transgender athletes would help understand the barriers faced by transgender athletes in sports [5,8,14]. Moreover, such information would support the development of an inclusive and fair environment within competitive sports.

As a result, this study surveyed soccer team staff in Japan and aimed to 1) evaluate staff knowledge of transgender-related terminology; and 2) explore their experience identifying transgender players and supporting them. We chose to study soccer team staff because soccer is one of the most popular team sports in Japan and worldwide, making it easier to recruit numerous participants.

Methods

Participants

This cross-sectional, questionnaire-based study was conducted between October 2018 and June 2019. We included all coaches, physicians, and physical trainers involved with soccer teams who attended 11 technical or medical meetings organized by the Japanese Football Association during the study period. Participants who provided incomplete responses were excluded from the analysis. Questionnaires were provided to all meeting participants, which they completed during 15-minute breaks between sessions. The Research Ethics Committee of the Graduate School of Medicine approved this study (Ethics Committee reference number: 3010). All participants provided written informed consent.

Questionnaire

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

Participant characteristics included age, gender (female, male, and none of the above/rather not specify), and profession (coach, physician, and physical trainer). In line with Tanaka [18], who noted a discrepancy in transgender knowledge between older and younger people, the age of participants was dichotomized into older (≥ mean age) and younger (< mean age) groups for statistical analysis. We further recorded participant’s certification, including the Japanese Football Association coach license; the sports physician license, as certified by the Japanese Sport Association, or the Japanese Orthopedic Association; and the certified physical trainer license, issued by either the Japanese Sport Association, or the American National Athletic Trainers’ Association [19]. Additionally, responses for the categories of teams that participants were actively involved with (women’s soccer, futsal, and men’s soccer, futsal, beach soccer, allowing for multiple choices) were classified into ‘women’s team’ (those who support at least one women’s team) and ‘only men’s team’ (those who support only men’s teams), for statistical analysis. Responses for the age categories of teams they were involved with (elementary school and younger, junior high school, high school, university, and adult) were dichotomized into ‘younger teams’ (those who support only teams of junior high school or younger) and ‘older teams’ (those who support at least one team of high school or older). This cutoff was determined based on the diagnostic and therapeutic guidelines for patients with gender identity disorder 4th edition [20], which states that in Japan, transgender persons can begin their transgender hormone therapy during their late teenage years. However, the policy of the Fédération Internationale de Football Association stipulates only conducting doping tests for soccer athletes in the over 17 categories.

To assess knowledge of transgender-related terminology, we asked whether participants understood the following three terms: 1) LGBT (lesbian, gay, bisexual, and transgender) [12,14], 2) transgender [12,14], and 3) the IOC Consensus Meeting 2015 [15]. Answers for each term were recorded as ‘yes,’ ‘no,’ or ‘I have heard of it, but do not know the meaning,’ and for analysis, these answers were recategorized as ‘yes’ and ‘no/not sure’ in line with Hisaka’s report [21]. After defining transgender, participants were asked to answer 10 questions on recognizing transgender players; for example, regarding their experience recognizing transgender players (Table 1). These questions were created based on a previous report of LGBT dental school students [11], input from the IOC consensus meeting 2015 report, and experts who provided insights on answers that were relevant to transgender athletes. Experts included coaches, physicians, physical trainers, sports lawyers, and sociologists. We also surveyed participants regarding the advice they had given transgender athletes when supporting them (e.g. transgender hormone therapy, gender affirming surgery, anti-doping, and activities supporting their daily living) [11] (Table 2), which could be important to the broader population of transgender athletes.
Table 1. Awareness of transgender players (n = 70).

| Question                                                                 | Yes | No | n  |
|--------------------------------------------------------------------------|-----|----|----|
| Have you ever recognized transgender players in the team you supported since you became a team staff? | Yes | 70 |    |
| If you answered “yes,” please answer the following questions.             |     |    |    |
| How many transgender players have you recognized?                        | <3  | 40 | (58) |
| ≥3 | 19 | (27) | |
| Not sure                   | 11 | (15) | |
| Which gender category did the transgender players belong to?             | Men | 12 | |
| Women | 95 | | |
| Have you ever recognized active transgender players who underwent transgender hormone therapy in your team? | Yes | 4 | (6) |
| No | 34 | (49) | |
| Not sure                   | 32 | (45) | |
| Have you ever recognized transgender players who retired to undergo transgender hormone therapy in your team? | Yes | 2 | (3) |
| No | 68 | (97) | |
| Not sure                   | 25 | (36) | |
| Have you ever recognized transgender players who underwent gender affirming surgery in your team? | Yes | 2 | (3) |
| No | 43 | (61) | |
| Not sure                   | 25 | (36) | |
| Have you ever recognized transgender players who retired to undergo gender affirming surgery in your team? | Yes | 12 | (17) |
| No | 13 | (19) | |
| Not sure                   | 45 | (64) | |
| Do you know transgender players in your team who underwent transgender hormone therapy after retirement or transfer to other teams? | Yes | 9 | (13) |
| No | 16 | (23) | |
| Not sure                   | 45 | (64) | |

Values show the number (%) of participants unless otherwise indicated.

* n = 478.
**Female-to-male players in women’s teams and male-to-female players in men’s teams.
***Multiple choices allowed.

Table 2. Experience to support transgender players.

| Question                                                                 | Yes | No | n |
|--------------------------------------------------------------------------|-----|----|---|
| Have you ever experienced/supported a player who seeks your advice on transgender-related issues? | Yes | 6 | |
| If you answered ‘yes’ to the previous question, what type of advice do you have?* | No | 478 | |
| Treatment (transgender hormone therapy, gender affirming surgery) | 3 |
| Anti-doping | 0 |
| Relations with teammates, family, and friends | 4 |
| Athlete career | 0 |
| Others (any additional comments) | 2 |
| Do your team or your school have a facility or system to support transgender players? | Yes | 13 | |
| If you answered ‘yes’ to the previous question, who is involved in the support?* | No/not sure | 471 | |
| Team staff | 0 |
| Hospital specialist (doctor, nurse, counselor) | 1 |
| School counselor | 10 |
| Others (any additional comments) | 4 |

*Multiple choices allowed.

An initial survey was administered among those involved in women’s football in universities in 2018 via a pilot study to select answer options and refine the questions. This was done as an informal survey at the request of the university. In this survey, we asked about participant characteristics, whether participants understood the three terms LGBT, transgender, the IOC Consensus Meeting 2015, and whether they had an awareness of transgender players. Subsequently, the final version of the questionnaire was used for data collection in this other sample. Additional questions included whether participants had identified someone as transgender on the teams they supported (female-to-male players in women’s teams and male-to-female players in men’s teams) and whether such players had undergone transgender hormone therapy and gender affirming surgery [6,11]. Answers included ‘yes,’ ‘no,’ or ‘not sure.’ The question details are shown in (Table 1). Furthermore, participants were asked four questions regarding their experience supporting transgender players [22]. These questions asked whether participants had experience supporting players on transgender issues and the details of this support. Additional questions included whether the participants’ teams or schools had facilities to support transgender athletes [11,22]. The question details are shown in (Table 2).

Statistics
Categorical data (patient characteristics, knowledge of transgender-related terminology, awareness of transgender players, and experience supporting transgender players) were expressed by frequency and percentage, while continuous data were represented by their mean and standard deviation. Univariate associations between the knowledge of transgender-related terminology and participant characteristics were assessed using chi-square tests and via post-hoc residual analysis to assess multiple comparisons. The age of the team category was excluded from the analysis because the majority (n = 460, 96%) of participants were categorized as members of older teams.
After univariate logistic regression analysis, multivariable logistic regression analyses were performed to explore independent associations, with knowledge of transgender-related terminology as the objective variable and the associated factors that showed significant associations in the univariate analysis at \( p < 0.1 \) being the explanatory variables. Participant characteristics (participants’ gender and professions, older or younger groups, certified licensees, and team gender) were entered as the independent variable regardless of their significance. For stepwise regression with degrees of freedom of 1, a cutoff value of \( p < 0.2 \) was employed to select variables for the final regression model with statistical significance set at \( p < 0.05 \). Similarly, associations between identifying transgender players and participant characteristics were assessed using univariate and multivariate analyses. Statistical analyses were performed using JMP 11.2.1 (SAS Institute Inc., Cary, NY, USA).

Results

Participant characteristics

Of the 512 attendees who attended all 11 meetings, 28 refused to participate in this survey. Six attendees were excluded for noninvolvement with soccer players at the time of the survey. Data from the remaining 478 attendees, including 119 coaches, 156 physicians, and 203 physical trainers, were used in our analysis (Table 3). In total, we evaluated responses from 30 females and 448 males with a mean age of 38 ± 10 years. Overall, 80% of the participants had certified licenses, 105 (22%) worked with women’s sports teams, and 373 (78%) worked with only men’s teams. Eighteen (4%) worked with only younger teams (< junior high school) and 460 (96%) worked with teams with an age bracket ≥ high school.

Knowledge of transgender-related terminologies

Overall, 358 (75%) understood the term ‘LGBT’ and 398 (83%) understood the terms ‘transgender’ (Table 4). However, only 33 (7%) were familiar with the IOC Consensus Meeting 2015.

In the univariate analysis, knowledge of LGBT was proportionately higher among females and physicians than among coaches and physical trainers (Table 4). Knowledge of transgenders was also higher among physicians and participants without certified licenses, and participants who worked with women’s teams. Similarly, in the older group, physicians and participants who worked with women’s teams also had greater levels of knowledge of transgender and the IOC Consensus 2015.

When disaggregated by age, while no statistically significant differences were found in the knowledge of LGBT, or transgender, older participants had statistically greater levels of knowledge on the IOC consensus meeting 2015. Across all transgender-related terms, there were statistically significant differences in knowledge between professions, with physicians demonstrating the highest levels of knowledge (Table 4). Similarly, multivariable logistic regression analysis showed that physicians possessed a greater knowledge of LGBT and transgender terms compared with others (LGBT; \( p < 0.01 \), OR 3.14; 95% CI 1.72–5.73 compared with coaches, \( p < 0.01 \), OR 2.50; 95% CI 1.41–4.43 compared with physical trainers, transgender; \( p < 0.01 \), OR 3.29; 95% CI 1.49–7.25 compared with coaches, \( p < 0.01 \), OR 3.97; 95% CI 1.91–8.26 compared with physical trainers). In addition, multivariable logistic regression analysis showed that those who worked with women’s teams

Table 3. Participant characteristics (n = 478).

| Age (years)* | Older (≥ 38, n = 247) | Younger (< 38, n = 231) |
|-------------|-----------------------|------------------------|
| Gender      | Female                | Male                   |
|             | 30 (6)                | 448 (94)               |
| Profession  | Coach                 | Physician              |
|             | 119 (25)              | 156 (33)               |
|             | Physical trainer      | 203 (42)               |
| Certified license | Yes | No                  |
|             | 383 (80)              | 95 (20)                |
|             | Coach                 | Physician              |
|             | 119                   | 104                    |
|             | Physical trainer      | 160                    |
| Gender category** | Women’s team | Only men’s team |
|             | 105 (22)              | 373 (78)               |

Values show the number (%) of participants unless otherwise indicated.

*Mean (standard deviation)

**Multiple choices allowed.

Table 4. Association between the knowledge of the transgender-related terms and participant characteristics (n = 478).

|               | LGBT |               | Transgender |               | IOC Consensus Meeting 2015 |               |
|---------------|------|---------------|-------------|---------------|-----------------------------|---------------|
|               | P    |               | P           |               | P                          |               |
| Age           | Older | 0.49          | 213 (86)    | 0.11          | 25 (10)                     | <0.01         |
|               | Younger | 0.49          | 185 (80)    |               | 8 (3)                       |               |
| Gender        | Female | 0.04          | 27 (90)     | 0.31          | 4 (13)                      | 0.15          |
|               | Male   |               | 371 (83)    |               | 29 (6)                      |               |
| Profession    | Coach  | <0.01         | 96 (81)     | <0.01         | 6 (3)                       | <0.01         |
|               | Physician | 146 (94)    | 156 (77)    |               | 21 (13)                     |               |
|               | Physical trainer | 156 (77) |               |               | 6 (3)                       |               |
| Certified license | Yes | 0.61          | 312 (81)    | 0.03          | 29 (8)                      | 0.25          |
|               | No    |               | 86 (91)     |               | 4 (4)                       |               |
| Gender category | Women | 0.06          | 95 (90)     | 0.03          | 18 (17)                     | <0.01         |
|               | Men   |               | 303 (81)    |               | 15 (4)                      |               |

Chi-square tests

Values show the number (%) of participants who answered “yes.”
Table 5. Association between awareness of transgender players and participant characteristics.

|                     | p     |
|---------------------|-------|
| Age                 |       |
| Older               | 0.49  |
| Younger             |       |
| Gender              |       |
| Female              | < 0.01|
| Male                |       |
| Profession          |       |
| Coach               | 0.17  |
| Physician           |       |
| Physical trainer    |       |
| Certified license   |       |
| Yes                 | < 0.01|
| No                  |       |
| Gender category     |       |
| Women               | < 0.01|
| Men                 |       |

Chi-square tests
Values show the number (%) of participants who answered “yes.”

possessed a greater knowledge of the IOC consensus meeting 2015 compared with those who supported men’s teams only (p < 0.01, OR 3.48; 95% CI 1.62–7.47).

Identification of and experience supporting transgender players
A total of 70 (15%) participants, including 20 coaches, 16 physicians, and 34 physical trainers, indicated that they identified transgender players on the teams they worked with (Table 5). Of these 70 participants, 19 indicated they worked with 3 or more players (Table 1). Thus, a total of 95 female-to-male players and 12 male-to-female players were identified with 92 playing on high school or older age bracket teams.

In a univariate analysis, female participants, participants with certified licenses, and those who worked with women’s teams were more likely to recognize transgender players (Table 5). Multivariable logistic regression analysis showed that participants with certified licenses (p < 0.01, OR 3.80; 95% CI 1.57–11.4) who worked with women’s teams were more likely to recognize transgender players (p < 0.01, OR 5.29; 95% CI 2.91–9.64).

Four (1%) participants, including 2 physicians and 2 physical trainers, witnessed active transgender players receiving transgender hormone therapy (Table 1). Additionally, 2 participants (1 coach and 1 physician) reported that they knew of players who retired to undergo transgender hormone therapy. Similarly, 11 participants (3 coaches, 1 physician, and 7 physical trainers) knew of active and retired players who received gender affirming surgery.

Of the 478 participants, 6 (1%), including 2 coaches, 2 physicians, and 2 physical trainers, had experience with directly supporting a player with transgender-related issues (Table 2). Consultations were conducted on treatment; relationships with teammates, family, and friends; changing their names; and going to the hospital. Some teams and schools possessed support services and school counselors, while others included school nurses and educational advisers.

Discussion
Overall, our results reflected that 75% understood the term LGBT, and knowledge of transgender-related terminology was proportionately higher among physicians than among other participants. Additionally, 15% of the participants indicated that they had identified transgender players who they worked with. Among these participants, a majority worked with women’s teams. However, only 1% of the participants had experience of directly supporting a player with transgender-related issues and 1% knew a transgender player who received transgender hormone therapy.

There are no similar previous studies with participants from the same background as those in our study. Previously, a survey of Canadian medical students conducted in 2017 [14] indicated that 66% were confident defining ‘LGBT’ and 91% defining ‘transgender.’ In an internet survey of the general population in Japan in 2018, conducted by Dentsu Inc., a Japanese advertising agency, 69% of the respondents had previously heard of the term ‘LGBT’ [23]. Another Japanese internet survey conducted in 2017 indicated that 69% of sports instructors registered with the Japanese Sports Association in 2017 had heard the term ‘LGBT’ [19]. It also found that an individual’s age, gender, education, and profession may influence their LGBT knowledge. Therefore, we too assume that the differences with our results in transgender-related knowledge are due to the participants’ demographics, as these are likely to influence their knowledge.

Our results show that only 7% of participants were aware of the IOC consensus 2015 meeting. This low value is consistent with a previous study [16] that found that only 3% of sports physicians knew the IOC Statement of the Stockholm Consensus on Sex Reassignment in Sports, the predecessor to the IOC Consensus 2015, in 2008 and 2010. Although the backgrounds of the participants in those studies were different from those in our study, the reason for the low value is consistent in that there are few opportunities to gain such knowledge in our country [16].

The grasp of transgender terminology was proportionately greater among physicians than among others. To the best of our knowledge, no previous studies have compared the level of knowledge of transgender-related terms across various athletic professionals. Only 10% of physical trainers in America receive formal training on the needs of transgender athletes [5]. On the other hand, many studies have surveyed college medical department participants on their curricula regarding gender minorities and indicate that physicians and medical students are willing to increase their knowledge of transgender issues [10,13,14,24]. Therefore, it is plausible that physicians have a greater understanding of transgender-related terms than coaches and physical trainers.

To the best of our knowledge, no previous report has investigated differences in the knowledge of the IOC consensus 2015 in the athletics field. Therefore, it is unclear why those who supported the women’s teams had greater knowledge of the IOC consensus 2015. However, the women’s teams may have had more transgender players, which translates to more experience among the participants, and, possibly, their enhanced knowledge of the IOC consensus 2015. This is consistent with findings from a previous report showing that people who have interpersonal relationships with LGBT individuals are more knowledgeable about LGBT issues [5,25].
This study found that about 15% of the staff self-reported that they had identified a transgender player through their services on the athletic staff. Most of these transgender players were female-to-male players on women’s teams. As the number of transgender athletes in sports has not been studied, we cannot know whether these results are generalizable. It is important to note that the number of transgender players identified by the staff in this study does not represent the prevalence of transgender players. Notably, 95 out of 107 transgender players are female-to-male players on women’s teams (Table 1); however, we emphasize that our results do not definitively confirm this. Our results are consistent with a previous report that determined that the prevalence of female-to-male transgender persons may be higher than male-to-female transgender persons in the general population in Japan [2].

The result that participants with certified licenses who worked with women’s teams identified more transgender athletes could be related to experience. Through certification and experience, staff will have studied how to treat soccer players better and have more experience supporting soccer players in general. This greater level of experience may also help such staff in diverse populations of athletes. Thus, it is plausible that staff with certified licenses, through their increased training and experience, could have more opportunities to identify and work with transgender players. Prior studies support the interpretation that LGBT people remain unseen or unheard, consciously or unconsciously, by others due to a lack of knowledge of LGBT issues [24]. Moreover, exposure to diversity is important for supporting LGBT individuals [26]. Thus, our results imply that through more knowledge and training, athletic professionals will be able to identify transgender players and provide them better support [24]. Indeed, Schott-Ceccacci, Holland, and Matthews reported that people who have experience and interpersonal contact with transgender people tend to have better attitudes toward transgender issues [26].

Altogether, 1% of the participants knew of a transgender player who received transgender hormone therapy and only 1% of the participants had experience helping a player with transgender-related problems directly. We did not survey specific information about the players, for example, which team the players belonged to or whether these transgender players received treatment from professionals. However, if they had received transgender hormone therapy before retiring, they would have had to abide by the IOC transgender hormone therapy regulations. In total, only 6 participants had experience supporting transgender players with respect to their lives or treatment. It is very important to offer support to transgender athletes in terms of treatment access, their mentality, and daily interactions with other players [1]. Schools allow transgender students to use the bathroom that matches their gender identity [6]. In contrast, Grant, Mottet, and Tanis report that 50% of transgender people experience a lack of knowledge among healthcare workers [27]. Other reports also indicate that patients do not receive satisfactory services due to the lack of knowledge of healthcare workers [13,28]. It has been suggested that training and educational opportunities for healthcare professionals are important in order to provide patients with helpful and comfortable support [5]. Likewise, similar to those working in schools and healthcare workers, to create a comfortable climate that prevents discrimination and harassment, athletic professionals have a responsibility to educate themselves on transgender issues and to support transgender athletes [1,10,24,29].

A previous report showed that school education programs effectively improved knowledge of LGBT issues [9,12]. However, training courses for certifying coaches, physicians, and physical trainers in Japan do not incorporate knowledge of transgender issues [5]. Incorporating a transgender educational program into training courses would further improve the knowledge of transgender issues across team staff [5]. Additionally, there is no consensus on the eligibility of transgender athletes for participating in competitive sports. Indeed, only a few international sports federations have a clear rule [1]. The 2015 IOC consensus represents a basic guideline from which suitable regulation for each sport can be based. Athletes, athletic professions, and team staff should understand such guidelines to maintain fair sports participation [30]. Moreover, education is needed to increase knowledge of transgender issues [5,9,12].

This study has several limitations. First, each participant’s knowledge of transgender-related terminology was self-reported. Referring to previous reports, we asked participants to answer ‘yes,’ ‘no,’ or ‘I have heard of it but do not know the meaning’ about transgender-related terminology; it is not possible to verify the accuracy of the answers in particular, or ‘yes,’ and ‘I have heard of it, but do not know the meaning.’ This is a limitation of the questionnaire survey. Similarly, the question of whether participants were aware of the IOC Consensus Meeting 2015 was asked with reference to previous reports, but it was not possible to ascertain the extent of participants’ knowledge of the meeting, which is another limitation of the questionnaire survey. Whether a participant had identified transgender players through their work was, again, self-reported. Therefore, many of the identified players might not be transgender players. Second, as we generated questions to evaluate participants’ experience with supporting transgender players, it is possible that respondents felt pressure to report supporting a transgender player when, in fact, they had not.

**Conclusion**

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

**Abbreviations**

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

**Availability of Data and Materials Data sharing**

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.
Authors’ contributions
All authors contributed significantly to the editing, synthesis, proofreading, and revision of this manuscript. All authors read and approved the final manuscript.

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Declaration of interest
The author(s) report no conflicts of interest.

Ethics Approval and Consent to Participate
The Research Ethics Committee of the Graduate School of Medicine approved this study (Ethics Committee reference number: 3010).

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