Original Article

Sex-based age differences in the Norwegian top soccer leagues

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ABSTRACT

This study aims to examine sex-based age differences in the Norwegian top soccer league, the relationship between age and performance level, and the presence of the relative age effect (RAE) in the same population of players. Players' birthdates were obtained from publicly available databases, and the total sample comprised 663 players (231 women, 432 men) from 26 teams (10 women's teams and 16 men's teams). For the RAE analyses, birth months were categorised in birth quartiles: Q1: January–March, Q2: April–June, Q3: July–September, Q4: October–December. The median age of the players was significantly lower for women than for men [22.1 (15.0–38.2) vs. 24.5 (15.5–38.4) $p < .001$]. A very large correlation between the median age of the team and the team performance was found in the women's league ($r_s(10) = -0.72$, $p = .019$), while no correlation was found in the men's league ($r_s(16) = 0.22$, $p = .405$). Chi-square analysis showed a difference between the observed and expected birth quartile distributions for the total sample, male players, and female players ($p < .05$). The lower age observed for the women than for the men indicates the need to prolong female players' careers through greater support, allowing them to reach their performance potential.
Keywords: Football, Gender, Relative age effect.

INTRODUCTION

Soccer is among the most popular sports worldwide and also in the Nordic countries. The sport imposes high demands on the players' physical capacity, technical and tactical qualities and is characterised by periods of high-speed running interspersed by low-intensity activity such as walking and jogging (Bangsbo, Mohr, & Krustrup, 2006; Bradley, Di Mascio, Peart, Olsen, & Sheldon, 2010). Although considerable variation within and across sports in the amounts of training and time required to reach an elite level has been reported (Rees et al., 2016), most studies agree that a relatively long period (10–15 years) of dedicated training is necessary to reach an elite level (Ericsson, 2020; Rees et al., 2016). Therefore, the possibility of long-term training and performance development is likely also a prerequisite to reach peak performance in soccer. Accordingly, the age of peak performance for male soccer players has been reported to be between 25 and 27 years (Dendir, 2016) with an aging trend recently observed among male Champions League players (Kalén, Rey, de Rellán-Guerra, & Lago-Peñas, 2019). However, there is a lack of comparable data on female soccer players.

Although female soccer has made considerable progress in recent decades, there are still significant sex-based differences in factors such as financial resources and media attention compared with male soccer (Morra, LaMorte, & Rojas, 2015). The dropout rates from soccer are also reported to be higher among girls than among boys (Deelen, Ettema, & Kamphuis, 2018; Møllerløkken, Lorås, & Pedersen, 2015). An interesting question is therefore whether a lower proportion of female soccer players than male soccer players are able to continue their careers sufficiently long to reach their age of peak performance. A previous study investigating the age and performance level of female soccer players during the London 2012 Olympic Games found that the highest-performing teams also had the highest average ages, whereas the teams that did not qualify for the quarter-finals were significantly younger (Barreira, 2016). The authors highlighted the need to prolong female players' careers through greater support, allowing them to reach their performance potential (Barreira, 2016). However, the data are relatively old, and there is a lack of information about sex-based age differences in performance-matched male and female elite soccer players.

Another interesting age-related factor is the relative age effect (RAE). The RAE has been demonstrated in several sports over the last thirty years and refers to an asymmetry in the birthdate distribution, with more players being born early in the year and fewer players being born late in the year (Musch & Grondin, 2001). The causes of the RAE have been suggested to be multifactorial, including a combination of physical, cognitive, emotional and social factors (Musch & Grondin, 2001). In soccer the RAE has been observed in both youth and senior players and at different performance levels (e.g., recreational to elite) (Brustio et al., 2018; Pedersen, Aune, Dalen, & Lorås, 2022; Sarmento, Anguera, Pereira, & Araújo, 2018). The most common explanation of the RAE in soccer is that a higher chronological age is accompanied by physical and anthropometrical factors (e.g., height, strength and endurance) providing a performance advantage (Lovell et al., 2015). Furthermore, soccer is a popular sport with many participants and strong competition for places in higher ranked teams. Some studies indicate that the RAE is less pronounced among female athletes than in male athletes (Hill, Scott, Malina, McGee, & Cumming, 2020). This could be due to the approximately two-year earlier onset of puberty in females, leading to smaller physiological differences among girls than among boys at the time when the strictest selection regimes start (Smith et al., 2018). Another factor is the lower number of female players than male players; in sports with fewer participants, the competition is less intense and the selection starts later, thereby reducing the RAE (Musch & Grondin, 2001). However, the RAE has also been demonstrated among female soccer players (Delorme, Boiché, & Raspaud, 2010). A recent study including data from youth and senior world cup tournaments found the RAE among both male and female youth players (Pedersen et al., 2022). Interestingly, the same study reported the RAE in the two most recent

senior male tournaments but no RAE in the four most recent female tournaments. Nevertheless, the study highlighted an increasing trend of the RAE among both male and female players (Pedersen et al., 2022).

An interesting question is how this increasing trend of RAE coincides with the aging trend observed among soccer players and the potential presence of sex differences in this phenomenon. Accordingly, more information about sex-based age differences and their potential interaction with the performance level and RAE in senior soccer players is required. Therefore, the aim of this study is to examine sex-based age differences in the Norwegian top soccer leagues, the relationship between age and performance level, and the presence of the RAE in the same population of players.

MATERIALS AND METHODS

Participants
Players' birthdates were obtained from three different websites (NIF, 2022; Transfermarkt, 2022; TV2, 2022). The total sample comprised 663 players (231 women, 432 men) from 26 teams in the Norwegian top soccer leagues (10 women's teams and 16 men's teams). All players' names, numbers of matches and birthdays were screened and systemised. Players in the teams that had not played in any matches were excluded before the first analysis. This study was conducted in accordance with the Declaration of Helsinki and approved by the Norwegian Social Science Data Services. Since the data are based on publicly available resources, no informed consent was obtained.

Procedures
Sex-based differences in age were investigated by comparing all players, the players of the top three teams, and the players of the upper and lower halves of the women's and men's leagues. To investigate the relationship between age and performance level, correlation analyses between age and team performance level (rank in league) were conducted. The age of the players at the middle of the season was calculated, using the same date (1st July 2022) for men and women. For the RAE analyses, birth months were categorized in birth quartiles: Q1: January–March, Q2: April–June, Q3: July–September, Q4: October–December.

In the 2022 season, the Norwegian FA introduced a new system for the women's top league, where the team's first played two matches (home/away) against each opponent, in total 18 matches for each team. Thereafter, the top four teams participated in a final playoff, and the bottom six teams played against the top teams from the second level. On the other hand, the men's league had a traditional competition format without any playoffs. The men's league included 30 matches for each team. To make a valid comparison between men and women, the team ranking after the 18 preliminary matches in the women's league and at the end of the season in the men's league was included in the analyses.

Analyses
The data did not meet the assumption of a normal distribution and is therefore presented as median (range). The Mann–Whitney U test was used to compare the ages of male and female players. Correlation analyses between age and team performance level (rank in league) were conducted using the non-parametric Spearman's correlation coefficient. The strength of the correlations was interpreted according to Hopkins et al. (2009): $r < 0.1$ = trivial, 0.1–0.3 = small, 0.3–0.5 = moderate, 0.5–0.7 = large, 0.7–0.9 = very large, 0.9 = nearly perfect, 1.0 = perfect. We performed hypothesis tests in accordance with Chen and Popovich (Chen & Popovich, 2002) to compare the strength of correlations statistically. A series of chi-square (χ^2) goodness-of-fit tests were performed to determine differences between the observed birth months of the female soccer

players and the expected birth month distribution for females born in Norway from 1983 to 2007 (the same years of birth as the players) of Q1: 25.07% (n = 359,440), Q2: 26.19% (n = 375,462), Q3: 25.67% (n = 368,002) and Q4: 23.06% (n = 330,640) (Statistics Norway, 2022). The significance level was set at $p <$ .05, and the data were processed and analysed using IBM SPSS Statistics version 26 software for Windows (SPSS Inc., Chicago, IL, USA) and Office Excel 2016 (Microsoft Corporation, Redmond, WA, USA).

RESULTS

Sex-based difference in age
The age of the players was significantly lower for women than for men [22.1 (15.0–38.2) vs. 24.5 (15.5–38.4) $p < .001$]. A similar difference was observed for the upper half of the women's (top five teams) and men's (top eight teams) leagues [22.8 (15.8–38.2) vs. 24.4 (15.5–38.4) $p = .008$]. The largest sex-based difference was observed for the players of the lower half of the leagues [21.5 (15.0–34.2) vs. 24.6 (16.0–36.8) $p < .001$]. However, no sex-based age difference was observed for the players of the top three teams [23.2 (17.0–33.9) vs. 23.8 (15.5–35.1) $p = .0369$]. The overall distributions of age and the distributions in the women's and men's top soccer leagues are presented in Figure 1. The average age for the players of each team is presented in Table 1.

Table 1. Overview of the number of players and age distribution (median and range) of all teams in the Norwegian top soccer leagues.

	Women				Men			
Rank	#Players	Age Median (range)			#Players	Age Median (range)		
1	23	25.2	(17.0–	33.1)	25	24.9	(16.4–	33.6)
2	24	22.4	(17.3–	29.9)	31	24.3	(18.9–	32.1)
3	22	22.4	(17.5–	33.9)	28	22.6	(15.5–	35.1)
4	20	22.2	(17.8–	38.2)	22	24.5	(18.0–	32.5)
5	19	23.8	(15.8–	27.9)	27	23.0	(15.8–	38.4)
6	21	21.9	(16.1–	34.2)	28	24.8	(16.5–	32.3)
7	28	22.5	(17.7–	31.3)	23	23.1	(17.4–	34.2)
8	28	20.3	(15.0–	31.4)	28	26.6	(17.3–	35.1)
9	24	19.2	(16.5–	28.9)	26	25.9	(17.3–	32.7)
10	22	21.3	(16.9–	26.4)	22	24.0	(17.7–	34.9)
11					22	23.7	(19.2–	33.4)
12					25	22.3	(17.5–	33.7)
13					27	25.9	(16.8–	32.9)
14					33	24.7	(16.0–	31.8)
15					31	24.6	(17.1–	36.8)
16					28	25.2	(19.6–	30.9)

Correlation between age and performance level of teams
A small but significant correlation was observed between age and performance level (team rank) for the female players (r_s(231) = -0.26, $p < .001$), while no correlation between age and performance level was found for the male players (r_s(432) = -0.016, $p = .744$). Furthermore, a very large correlation between the median age of the team and the team performance was found in the women's league (r_s(10) = -0.72, $p = .019$), while no correlation was found for the men's league (r_s(16) = 0.22, $p = .405$). The correlation between median age and team performance is presented in Figure 2.
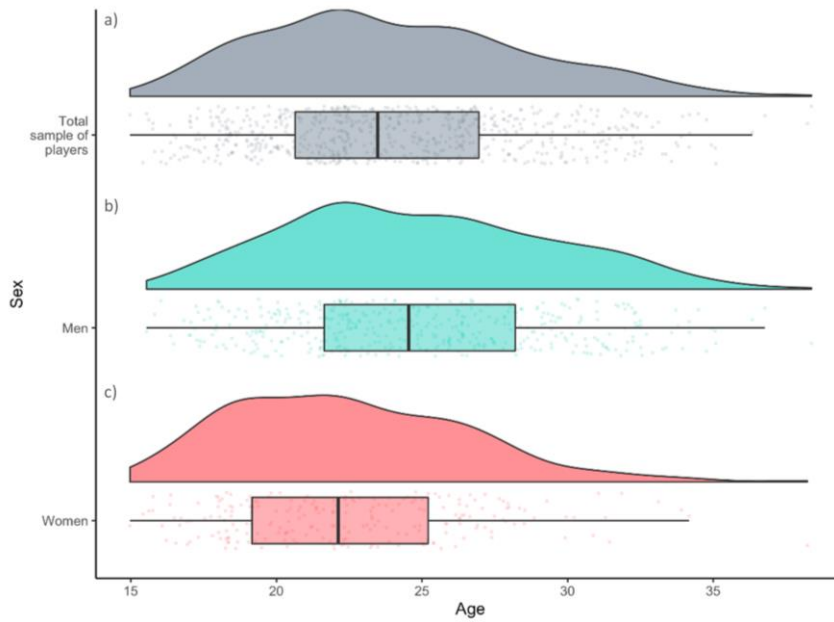
Figure 1. Overview of the age distribution (histograms with median and IQR) for the total sample of players (a), the male players (b) and the female players (c) in the Norwegian top soccer leagues.
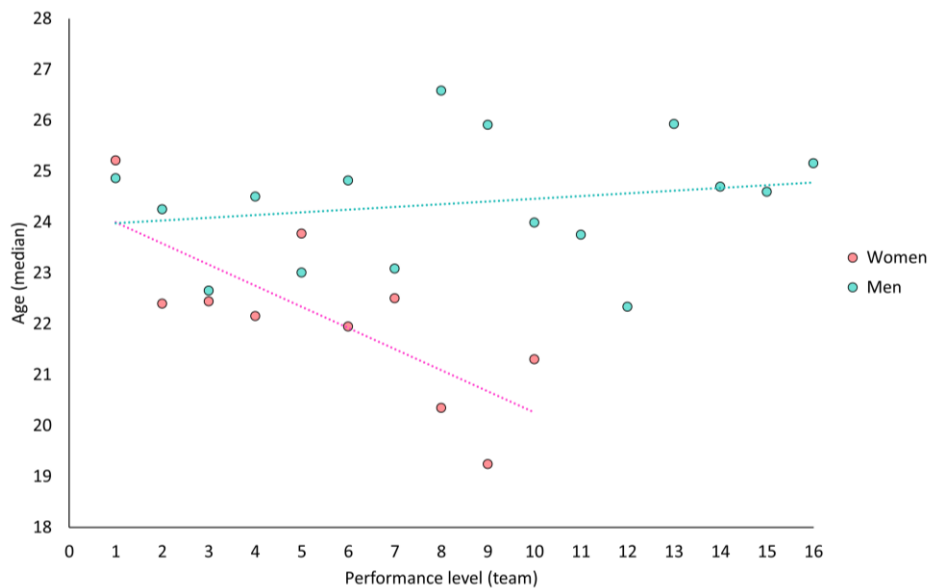

Figure 2. Overview of the median age and performance level for each team in the women's and the men's Norwegian top soccer leagues.

Relative age effect

The chi-square analysis indicated a statistical difference between the observed and expected quartile distributions for all groups (total, women and men), indicating a significant RAE in all populations of players. The chi-square test and the post hoc analyses revealed an overrepresentation of players born at the beginning of the year (Q1) and an underrepresentation of players born at the end of the year (Q4) compared with the birth distribution of the general population. The birthdate distributions for the total, male and female

populations are presented in Figure 3. The birthdate distributions for the total, male and female populations along with the corresponding distributions for the general population are presented in Table 2.
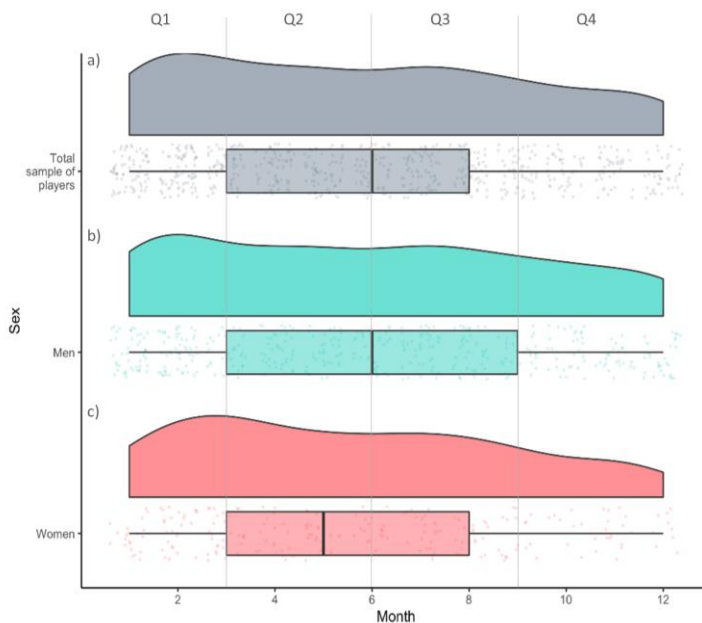

Figure 3. Overview of the distribution of birthdates across the annual quartiles (histograms with median and IQR) for the total sample of players (a), the male players (b) and the female players (c) in the Norwegian top soccer leagues.

Table 2. The distribution of birthdates across the annual quartiles for the total sample of players, male players and female players in the Norwegian top soccer leagues, along with the corresponding distributions for the general population in Norway.

	Numbers in quartiles				Percent in quartiles						Standardised residuals			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	X^2	p	Q1	Q2	Q3	Q4
Total														
Observed	210	168	169	116	31.7	25.3	25.5	17.5	20.6	<.001	43.8	-5.7	-1.2	-36.9
Expected	166	174	170	153	25.1	26.2	25.7	23.1						
Women														
Observed	78	60	60	33	33.8	26.0	26.0	14.3	14.7	.002	20.1	-0.5	0.7	-20.3
Expected	58	61	59	53	25.1	26.2	25.7	23.1						
Men														
Observed	132	108	109	83	30.6	25.0	25.2	19.2	8.2	.042	23.7	-5.2	-1.9	-16.6
Expected	108	113	111	100	25.1	26.2	25.7	23.1						

Note. Q1: January–March, Q2: April–June, Q3: July–September, Q4: October–December.

DISCUSSION

This study investigated the sex-based age differences in the Norwegian top soccer leagues, the relationship between age and performance level, and the presence of the RAE in the same population of players. The major findings were as follows: 1) The age of the female players was significantly lower than that of the male players, which was also observed when the top half of the teams were compared. 2) There was a strong

correlation between the median age of the team and the team performance in the women's league, with no correlation observed in the men's league. 3) The RAE was present in both the women's and men's leagues.

A significantly lower age was found for the women than for the men in the Norwegian top soccer leagues. The reason for this difference is likely multifaceted, and unfortunately there is a lack of comparable data from other top soccer leagues. One reason for the observed sex-based difference in age may be the result of a lower number of female players, partly caused by the higher dropout rates among young female soccer players (Møllerløkken et al., 2015). However, it is also likely that the greater access to resources, greater professionalisation and higher salaries in the men's league make it possible for a greater proportion of male players to pursue their career (Garris & Wilkes, 2017; Morra et al., 2015). This argument is supported by the larger age difference observed between the lower ranked teams than between the higher ranked teams. Although no sex-based age difference was observed in the top three teams, the women in the lower ranked half of the teams were almost three years younger than the corresponding players in the men's league. On the basis of our findings, it therefore appears that only the highest-performing women's teams are able to establish a squad at the same age level as the men's league. Considering the age of peak performance among male soccer players (25–27 years) and the fact that long-term development is necessary to reach an elite level in sports (Rees et al., 2016), our findings indicate that many female Norwegian soccer players drop out before they reach their performance potential.

Furthermore, a strong correlation between median age and team performance was found in the women's league, with no correlation found in the men's league. Although little research exists in this area, our findings align with those of Barreira's (2016) study from the 2012 Olympic Games, which reported that teams with a higher average age performed better. Accordingly, the women in the highest ranked female team in our study were substantially older than those in the other teams. Although the participation rate, status and professionalisation of women's soccer have made considerable progress in the last decade (Randell et al., 2021), with significant increases in salaries and a doubling of the number of professional players from 2013 to 2017, it appears that this development of women's soccer is currently only visible among the highest-performing Norwegian teams. Accordingly data from 2021, reported that only ~12% of the female players in the Norwegian top league were able to make a living from playing soccer (Lygren, 2021). Even though economic differences between the highest and lowest ranked teams are also likely present in the men's league, these differences do not appear to affect the age of the players. Another factor contributing to the earlier dropout of female players could be a lack of support for pregnant players, recently highlighted in both national and international soccer leagues (Culvin & Bowes, 2021; Jørnholt, 2023; Martin, 2023). Furthermore, because of the recent development of several European female soccer leagues, it is possible that a relatively large number of older and more established Norwegian female players are leaving the country in search of greater professionalism and higher salaries elsewhere. More research is required to investigate whether the observed correlation between age and performance level is also present in other countries.

An interesting finding in this study was the presence of the RAE among both women and men playing in the Norwegian top soccer leagues. Whereas the presence of the RAE in the men's league is in line with previous research (Brustio et al., 2018; Sarmento et al., 2018), the observed RAE among female players was unexpected. Previous studies have indicated a lower RAE among senior players than among junior soccer players and a lower RAE in women's than men's soccer (Pedersen et al., 2022). The lower RAE among female players has been explained by both the lower participation rates and the earlier onset of puberty in female players, leading to smaller physiological differences and/or lower competition, because the competition for higher performing teams becomes increasingly intense with increasing age (Delorme et al., 2010; Musch & Grondin, 2001; Pedersen et al., 2022). In line with our findings, recent data have revealed an

increased trend of the RAE among both male and female players (Pedersen et al., 2022). The reason for this is uncertain, but it has been speculated that the increased professionalism of female soccer has reinforced the RAE (Pedersen et al., 2022). Our finding of the RAE among senior male and female players might also be explained by the talent selection processes. In Norwegian soccer, there are similar processes when selecting players for higher ranked regional or national teams. Individuals already selected for a team are more likely to be selected again, thus perpetuating the RAE (Brustio et al., 2018). Moreover, as this study revealed a substantial sex-based difference in age, it is possible that the RAE in the women's league is also due to the higher proportion of younger players than that in the men's league. The players in the lower half of the women's league were on average almost three years younger than the corresponding male players, whereas the players in the bottom three teams were almost five years younger. Since younger players are in general more affected by the RAE, the RAE observed in our study might be due to the lower age in the women's compared to the men's leagues. However, our sample only provides a snapshot of one season, and more long-term data are needed to establish whether a trend of increasing RAE is present in female soccer.

CONCLUSIONS

Investigating the sex-based age differences in the Norwegian top soccer leagues revealed a significantly lower age in the women's compared to the men's league. This difference was also present when the teams ranked in the upper half of the league were compared. A strong correlation between the median age of the team members and the team performance was found in the women's league, while no correlation was observed in the men's league. Furthermore, the RAE was present in both the women's and men's leagues. Overall, this study highlights the need to prolong the careers of female soccer players through greater support, allowing them to reach their performance potential.

AUTHOR CONTRIBUTIONS

Conceptualization: IB, TD and GSS. Methodology: IB and GSS. Software: IB and GSS. Validation: IB and GSS. Formal analysis: GSS. Investigation: IB and GSS. Resources: IB, TD and GSS. Data curation: IB and GSS. Writing—original draft preparation: IB and GSS. Writing—review and editing: IB, TD GSS. Visualization: IB and GSS. All authors have read and agreed to the published version of the manuscript.

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No potential conflict of interest were reported by the authors.

REFERENCES

Bangsbo, J., Mohr, M., & Krustrup, P. (2006). Physical and metabolic demands of training and match-play in the elite football player. J Sports Sci, 24(7), 665-674. https://doi.org/10.1080/02640410500482529

Barreira, J. (2016). Age of Peak Performance of Elite Women's Soccer Players. International Journal of Sports Science, 6, 121-124.

Bradley, P. S., Di Mascio, M., Peart, D., Olsen, P., & Sheldon, B. (2010). High-intensity activity profiles of elite soccer players at different performance levels. J Strength Cond Res, 24(9), 2343-2351. https://doi.org/10.1519/JSC.0b013e3181aeb1b3

Brustio, P. R., Lupo, C., Ungureanu, A. N., Frati, R., Rainoldi, A., & Boccia, G. (2018). The relative age effect is larger in Italian soccer top-level youth categories and smaller in Serie A. PLOS ONE, 13(4), e0196253. https://doi.org/10.1371/journal.pone.0196253

Chen, P. Y., & Popovich, P. M. (2002). Correlation: Parametric and Nonparametric Measures. Sage Publications. https://doi.org/10.4135/9781412983808

Culvin, A., & Bowes, A. (2021). The Incompatibility of Motherhood and Professional Women's Football in England. Frontiers in Sports and Active Living, 3. https://doi.org/10.3389/fspor.2021.730151

Deelen, I., Ettema, D., & Kamphuis, C. B. M. (2018). Time-use and environmental determinants of dropout from organized youth football and tennis. BMC Public Health, 18(1), 1022. https://doi.org/10.1186/s12889-018-5919-2

Delorme, N., Boiché, J., & Raspaud, M. (2010). Relative age effect in female sport: a diachronic examination of soccer players. Scand J Med Sci Sports, 20(3), 509-515. https://doi.org/10.1111/j.1600-0838.2009.00979.x

Dendir, S. (2016). When do soccer players peak? A note. Journal of Sports Analytics, 2, 89-105. https://doi.org/10.3233/JSA-160021

Ericsson, K. A. (2020). Towards a science of the acquisition of expert performance in sports: Clarifying the differences between deliberate practice and other types of practice. J Sports Sci, 38(2), 159-176. https://doi.org/10.1080/02640414.2019.1688618

Garris, M., & Wilkes, B. (2017). Soccernomics: Salaries for World Cup Soccer Athletes. International Journal of the Academic Business World (11(2)), 103-110.

Hill, M., Scott, S., Malina, R. M., McGee, D., & Cumming, S. P. (2020). Relative age and maturation selection biases in academy football. J Sports Sci, 38(11-12), 1359-1367. https://doi.org/10.1080/02640414.2019.1649524

Hopkins, W. G., Marshall, S. W., Batterham, A. M., & Hanin, J. (2009). Progressive statistics for studies in sports medicine and exercise science. Med Sci Sports Exerc, 41(1), 3-13. https://doi.org/10.1249/MSS.0b013e31818cb278

Jørnholt, M. (2023). Toppserie-spilleren ble gravid: - Jeg følte meg som en byrde som ikke lenger var ønsket i klubben. NRK. NRK.

Kalén, A., Rey, E., de Rellán-Guerra, A. S., & Lago-Peñas, C. (2019). Are Soccer Players Older Now Than Before? Aging Trends and Market Value in the Last Three Decades of the UEFA Champions League. Front Psychol, 10, 76. https://doi.org/10.3389/fpsyg.2019.00076

Lovell, R., Towlson, C., Parkin, G., Portas, M., Vaeyens, R., & Cobley, S. (2015). Soccer Player Characteristics in English Lower-League Development Programmes: The Relationships between Relative Age, Maturation, Anthropometry and Physical Fitness. PLOS ONE, 10(9), e0137238. https://doi.org/10.1371/journal.pone.0137238

Lygren, I. (2021). 30 spillere i Toppserien kan leve av å spille fotball. Fire av dem spiller i nye Brann. Adresseavisen.

Martin, A. (2023). Sara Björk Gunnarsdóttir hails landmark maternity pay ruling as 'wake-up call' for football. The Guardian.

Morra, D., LaMorte, J., & Rojas, G. (2015). Differences Between Men and Women in Professional Soccer. John Jay College of Criminal Justice.

Musch, J., & Grondin, S. (2001). Unequal competition as an impediment to personal development: a review of the relative age effect in sport. Developmental Review, 21(2), 147-167. https://doi.org/10.1006/drev.2000.0516

Møllerløkken, N. E., Lorås, H., & Pedersen, A. V. (2015). A systematic review and meta-analysis of dropout rates in youth soccer. Percept Mot Skills, 121(3), 913-922. https://doi.org/10.2466/10.PMS.121c23x0

NIF. (2022). The Norwegian football association offcial web page.

Norway, S. (2022). Live births, by month 1966 - 2021.

Pedersen, A. V., Aune, T. K., Dalen, T., & Lorås, H. (2022). Variations in the relative age effect with age and sex, and over time-Elite-level data from international soccer world cups. PLOS ONE, 17(4), e0264813. https://doi.org/10.1371/journal.pone.0264813

Randell, R. K., Clifford, T., Drust, B., Moss, S. L., Unnithan, V. B., De Ste Croix, M. B. A., . . . Rollo, I. (2021). Physiological Characteristics of Female Soccer Players and Health and Performance Considerations: A Narrative Review. Sports Med, 51(7), 1377-1399. https://doi.org/10.1007/s40279-021-01458-1

Rees, T., Hardy, L., Gullich, A., Abernethy, B., Cote, J., Woodman, T., . . . Warr, C. (2016). The Great British Medalists Project: A Review of Current Knowledge on the Development of the World's Best Sporting Talent. Sports Med, 46(8), 1041-1058. https://doi.org/10.1007/s40279-016-0476-2

Sarmento, H., Anguera, M. T., Pereira, A., & Araújo, D. (2018). Talent Identification and Development in Male Football: A Systematic Review. Sports Medicine, 48(4), 907-931. https://doi.org/10.1007/s40279-017-0851-7

Smith, K. L., Weir, P. L., Till, K., Romann, M., & Cobley, S. (2018). Relative Age Effects Across and Within Female Sport Contexts: A Systematic Review and Meta-Analysis. Sports Med, 48(6), 1451-1478. https://doi.org/10.1007/s40279-018-0890-8

Transfermarkt. (2022). Tranfermarkt. Retrieved from: https://www.transfermarkt.com/[10.10.2022].

TV2. (2022). Alt om fotball. Retrieved from: https://www.altomfotball.no/element.do[10.10.2022].