On the heels of world football body FIFA’s highly publicised, last minute change of heart concerning the availability of alcohol at the 2022 Qatar World Cup, comes a study in which researchers of a Swedish study (p 488) compared the prevalence of alcohol related disorders among elite male footballers in Sweden with rates in men from the general population to determine whether elite players were at increased risk of such disorders.2

Perhaps unsurprisingly, population controls matched by sex, age, and geographical location had a significantly higher risk of alcohol related disorders than the footballer group. Most researchers would welcome the access to data from which this study benefits: the researchers were able to use players’ personal identity numbers (a number given to all Swedish citizens) to assess alcohol related diagnoses in footballers born from 1885 right through to the current century—a considerable wealth of information.

Ueda and colleagues focused on elite players, given the media attention to known instances of alcohol addiction in several high profile players. Using goal scoring, number of games, and number of seasons played in the top tier as proxies for level of performance or so called eliteness, the risk of an alcohol related disorder did not vary by performance. The protective effect of being an elite player on a diagnosis of alcohol related disorders was present only for players who first played elite football in the 1960s, but not for players from earlier eras.

**Brand promotion**

This finding is likely to reflect the economic changes in football in 1960-2000, when the opportunity to televise football brought new income into the game through advertising sales. During this period, corporations, including alcohol companies, were able to promote their brand to wider audiences.3

The increased revenue in the sport was accompanied by the professionalisation of players’ contracts and an increase in footballers’ incomes. Increased income is likely to have changed players’ drinking habits since the 1960s and mitigated alcohol related health harms.4

While the high profile, risk taking behaviour of a few footballers captures media attention, it is perhaps more relevant to the current century—a considerable wealth of information.

Kylian Mbappe has sought to avoid promoting alcohol, as he is aware of being a role model for children from a public health perspective to focus on football consumers: the fans. Arguably, sport sponsorship was developed by the tobacco and alcohol industries, with active involvement by the food and drink industry, eager to promote products that are high in fat, salt, or sugar. With the development of digital technologies these industries were joined by the gambling industry.

All clamour to reach the global audiences that international football can command, seeking to be associated with the game’s excitement and passion. Unhealthy commodity industries are keen to obscure the health hazards associated with consumption of their products and have, arguably, successfully sought a so called health halo by associating themselves with sport.5 When transnational corporations such as Coca-Cola, AB InBev (Budweiser is one of their brands), and Mondelez International (the owners of Cadbury) sponsor football clubs and competitions, they expect a return on their investment.8 Campaigns such as Budweiser’s “Light Up the FIFA World Cup” in 2018 ran in 50 countries across television and digital channels, helping to drive up beer revenues by 10%.9 A 2022 audit of 178 elite professional male football teams in 10 European countries found that three quarters of the teams had at least one alcohol related sponsor or partner.10

**Impact of marketing**

Since marketing and sponsorship are designed to encourage consumption, one might hypothesise that alcohol disorders would be highest among fans, in direct contrast to the players. Evidence certainly indicates that alcohol marketing is directly linked with higher consumption, particularly among young people.15 With growing opportunities for data linkage with electronic health records, as exemplified here in Sweden, researchers might be able to compare the incidence of alcohol related disorders between the general population and football fans to ascertain the impact of football related marketing.

Further research could also look at how and when elite footballers object to alcohol sponsorship and whether elite footballers pushing back on alcohol can influence the consumption habits of fans. Before the 2022 World Cup ban, at the 2020 European Championship (held in 2021 because of the pandemic), Paul Pogba—the French footballer and a practising Muslim—moved a bottle of the sponsor’s beer away from the camera.12 Following in his footsteps, his teammate Kylian Mbappe was reportedly hiding Budweiser’s name in his post-match photos in Qatar because he wanted to avoid promoting alcohol, being aware that he is a role model for many French children.13

Despite, as this study suggests, lower rates of alcohol related health disorders among modern elite football players, clubs, competitions, and leagues in 2022 (including in Sweden) continue to promote alcohol alongside other unhealthy commodities.8 While fans could not buy alcohol at Qatar matches, digital advertising boards alongside the pitch promoted beer to millions of TV viewers. Playing football might be healthy but watching could be the very opposite.

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PHYSICAL

ORIGINAL RESEARCH Nationwide cohort study

Alcohol related disorders among elite male football players in Sweden

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Objective To assess whether male elite football players are at increased risk of alcohol related disorders compared with men from the general population.

Design Nationwide cohort study.


Participants 6007 male football players in the Swedish top division, Allsvenskan, from 1924 to 2019 and 56 168 men from the general population matched to players based on age and region of residence.

Main outcome measures Diagnoses of alcohol related disorders registered in national health registers.

Results During follow-up to 31 December 2020, 257 (4.3%) football players and 3528 (6.3%) men from the general population received diagnoses of alcohol related disorders. In analyses accounting for age, region of residence, and calendar time, risk of alcohol related disorders was lower among football players than among men from the general population (hazard ratio 0.71, 95% confidence interval 0.62 to 0.81).

Conclusion In this nationwide cohort study, male football players who had played in the Swedish top tier of competition had a significantly lower risk of alcohol related disorders than men from the general population.

Introduction

Numerous football players (including some of the finest in history), have had alcohol addiction during and after their careers. Data on the epidemiology of alcohol related disorders among elite football players could inform the need for psychosocial support and prevention of such disorders among elite football players as well as the discussion regarding the association between football, alcohol, and public health.

In Sweden, similar to many other countries, alcohol consumption has been deeply ingrained in football culture for both players and fans. In this study, we used a nationwide cohort of male football players in the top tier of competition in Sweden and nationwide register data to assess whether elite football players were at increased risk of alcohol related disorders compared with men from the general population.

Methods

Information about football players was collected from data sources of all current and former football players in the Swedish top tier of competition, Allsvenskan, and was compiled by the Swedish Association of Football Historians and Statisticians. All football players who had played at least one game in Allsvenskan from its first season in 1924 to 2019 were included. We excluded players whose personal identity number was not available in the databases.

Each football player was matched in a 1:10 ratio with men from the general population, based on year of birth, region of residence, and vital status. The matching date was 1 January in the year when the football player played his first game in Allsvenskan or was first registered as a football player.
Results

The analyses included 6007 football players and 56 168 men from the general population. The median number of games played in the top tier of competition in Sweden among football players was 23 (interquartile range 6-76).

During a mean follow-up of 27.2 years, 257 (4.3%) football players and 3528 (6.3%) men from the general population experienced alcohol related disorders. In analyses using Cox regression (with age as the time scale and adjusted for matching variables and calendar time as a time varying covariate), the risk of alcohol related disorders was significantly lower among football players than among men from the general population (hazard ratio 0.71, 95% confidence interval 0.62 to 0.81).

We modelled the interaction between the year of the player’s first season in the top division using restricted cubic splines with three knots. The hazard ratio and 95% confidence interval indicated no significant difference in risk of alcohol related disorders among football players who played their first season in the top tier before the 1960s compared with men from the general population, with the protective association emerging for those who played their first season in the early 1960s and later.

Discussion

Although alcohol related disorders among active and retired elite athletes have been subject to much attention and research interest, large scale cohort studies assessing this outcome are scarce. Taken together, the current evidence indicates that elite football players have a lower risk of alcohol related disorders during and after their career than men from the general population.

Potential mechanisms for the protective association include that an elite football career might not be compatible with high alcohol consumption. In fact, the careers of many of the famous footballers who struggled with alcohol addiction were severely impaired by their drinking. We found that the lower risk of alcohol related disorders emerged for football players who played their first season in the top tier in the 1960s and onward, aligning with trends towards increasing professionalism and competition among elite players.

Limitations of this study

Depending on individuals’ health seeking behaviour and clinical manifestations of alcohol addiction, substantial amounts of time could have passed between the start of alcohol addiction and the registration of the outcome event in the registers.

Moreover, individuals could have had alcohol related disorders without receiving a diagnosis, although the likelihood of such an outcome misclassification is unlikely to differ between football players and men from the general population. We did not have access to data on family histories of alcohol related disorders, which might have differed between football players and men from the general population.

Finally, our study included male elite football players and the generalisability of our findings to female elite players and to male and female amateur and youth players (who constitute most football players worldwide) is uncertain.

Alcohol consumption has been deeply ingrained in football culture for both players and fans

Residents in Sweden (if this occurred after the first year of play in Allsvenskan), and matching was performed using the Total Population Register. For players who played their first season before 1969 (ie, the start of the Total Population Register), we selected men from the general population matched by vital status and region of residence on 1 January 1969. The date when players and men from the general population were matched constituted cohort entry. We excluded players (and matched men from the general population) and men from the general population who were not born in Sweden and who had their first date of residence in the country after age 15 years.

The primary outcome was alcohol related disorders recorded in the Cause of Death Register (primary or contributing causes of death), National Patient Register (primary or secondary diagnosis during hospital or outpatient visits), or Prescribed Drug Register (filled prescriptions for drugs used to treat alcoholism).

The analyses included 6007 football players and 56 168 men from the general population. The median number of games played in the top tier of competition in Sweden among football players was 23 (interquartile range 6-76).

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Finally, our study included male elite football players and the generalisability of our findings to female elite players and to male and female amateur and youth players (who constitute most football players worldwide) is uncertain.
Quantifying the benefits of inefficient walking

Glenn A Gaesser, David C Poole, Siddhartha S Angadi

Objective To compare the rate of energy expenditure of low efficiency walking with high efficiency walking.

Design Laboratory based experimental study.

Setting United States.

Participants 13 healthy adults (six women, seven men) with no known gait disorder, mean (±standard deviation) age 34.2±16.1 years, height 174.2±12.6 cm, weight 78.2±22.5 kg, and body mass index 25.6±6.0.

Intervention Participants performed three, five minute walking trials around an indoor 30 m course. The first trial consisted of walking at a freely chosen walking speed in the participant’s usual style. The next two trials consisted of low efficiency walks in which participants were asked to duplicate the walks of Mr Teabag and Mr Putey (acted by John Cleese and Michael Palin, respectively) in the Monty Python Ministry of Silly Walks skit that first aired in 1970. Distance covered during the five minute walks was used to calculate average speed. Ventilation and gas exchange were collected throughout to determine oxygen uptake (VO₂; mL/kg/min) and energy expenditure (EE; kcal/kg/min; 1 kcal=4.18 kJ), reported as mean±standard deviation.

Main outcome measures VO₂ and EE.

Results VO₂ and EE were about 2.5 times higher (P<0.001) during the Teabag walk compared with participants’ usual walk (27.9±4.8 v 11.3±1.9 mL/kg/min; 0.14±0.03 v 0.06±0.01 kcal/kg/min), but were not different during the Putey walk (12.3±1.8 mL/kg/min; 0.06±0.01 kcal/kg/min). Each minute of Teabag walking increased EE over participants’ usual walking by an average of 8.0 kcal (range 5.5-12.0) in men and by 5.2 kcal (range 3.9-6.2) in women, and qualified as vigorous intensity physical activity (≥6 resting metabolic equivalents).

Conclusions For adults with no known gait disorder who average approximately 5000 steps/day, exchanging about 23-44% of their daily steps with higher energy, low efficiency walking in Teabag style—requiring around 12-19 min—could increase daily EE by 100 kcal. Adults could achieve 75 minutes of vigorous intensity physical activity per week by walking inefficiently for about 11 min/day. Had an initiative to promote inefficient movement been adopted in the early 1970s, we might now be living among a healthier society. Efforts to promote higher energy—and perhaps more joyful—walking should ensure inclusivity and inefficiency for all.

WHAT IS ALREADY KNOWN ON THIS TOPIC

• Inactivity levels globally have been largely intractable to campaigns to increase physical activity and boost cardiovascular fitness in adults
• Mr Teabag’s and Mr Putey’s inefficient walking techniques in the Ministry of Silly Walks skit are reported to be 3-7 times more variable than usual walking, but energy inefficiency has not been quantified

WHAT THIS STUDY ADDS

• Inefficient walking—Teabag style—increases energy expenditure in adults by about 2.5-fold compared with their usual walking style
• Adults could achieve 75 minutes of vigorous intensity physical activity per week by walking in Teabag style for about 11 min/day
• Substituting usual style steps with Teabag style steps for about 12-19 min/day would increase daily energy expenditure by approximately 100 kcal

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Introduction and methods

Global rates of physical inactivity (WHO definition, <150 minutes of moderate intensity activity weekly, or equivalent) have not budged in the past 20 years, while the prevalence of cardiovascular disease has doubled since 1990. There is a Darwinian neurophysiology and psychology that selects or modifies individual behaviours to minimise perceived effort, termed TEMPA—theory of effort minimisation in physical activity.

To counter this problem, we propose PEMPA—practice of effort maximisation in physical activity. We take our lead from Monty Python’s Ministry of Silly Walks skit aired in 1970. In proposing PEMPA, we recognise that evolution has adapted humans anatomically, biomechanically, and physiologically to move in increasingly energy efficient ways. Still, with respect to cardiovascular fitness, inefficiency of movement might be a desired trait. In our study, we quantified the energy cost of walking like Mr Teabag and Mr Putey from the Ministry of Silly Walks.

Participants comprised six women and seven men aged 22-71 from the US. Each was fitted with a portable metabolic measurement system and performed three, five minute walking trials around an indoor 30 m course. In the first trial the participants walked in their usual style at a normal pace. In the second and third trials they performed the Putey and Teabag walk, respectively.

Ventilation and gas exchange were recorded throughout each trial to determine oxygen uptake ($V_O_2$; mL $O_2$/kg/min) and energy expenditure (EE; kcal/kg/min; 1 kcal=4.18 kJ), reported as mean±standard deviation.

Statistical analysis

Linear mixed models were used to examine variances in $V_O_2$ and EE among participants across the different walking styles.

Results

Only the Teabag walk resulted in a significantly increased $V_O_2$ (27.9±4.8 mL/kg/min, 95% CI 24.3 to 30.9) and EE (0.06±0.03 kcal/kg/min, 95% CI 0.03 to 0.15; P<0.001) compared with the participants’ usual walk ($V_O_2$: 11.3±1.9 mL/kg/min, 95% CI 10.1 to 12.4; EE: 0.06±0.01 kcal/kg/min, 95% CI 0.04 to 0.07), which was similar to the Putey walk ($V_O_2$: 12.3±1.8 mL/kg/min, 95% CI 10.9 to 13.4; EE: 0.06±0.01 kcal/kg/min, 95% CI 0.05 to 0.07).

For our participants, exchanging one minute of walking in their usual style with one minute of Teabag walking increased EE by an average of 8.0 kcal min for men and 5.2 kcal/min for women (table). For all three walks, EE (kcal/min) was significantly correlated with body mass.

Discussion

The higher EE during the Teabag walk (~2.5 fold) would amount to a substantially greater EE even if only practised for a few minutes a day. Following PEMPA principles, for our participants the higher EE (~5-8 kcal/min) could increase total daily EE by about 50-80 kcal if practised for 10 min/day, and by about 150-240 kcal if practised for up to 30 min/day. The average $V_O_2$ during the Teabag walk was 30.4 mL $O_2$/kg/min or about 8.7 resting metabolic equivalents (METs; 1 MET=3.5 mL $O_2$/kg/min) for male participants, and 25.0 mL $O_2$/kg/min (~7.1 METs) for female participants. These data exceed the MET threshold for vigorous intensity exercise for adults, and exercise at these intensities is known to increase cardiorespiratory fitness. Adults could therefore achieve 75 minutes of vigorous intensity physical activity per week by walking for about 11 min/day. This amount of Teabag walking would also be likely to reduce mortality risk, as 60 min/week (~9 min/day) of vigorous intensity physical activity is associated with a lower risk of all cause mortality of about 10%. Inefficient walking, in its embrace of PEMPA, does not add to total time spent being physically active, but replaces lower energy, more efficient activity (one’s usual walking) with higher energy, lower efficiency movement. Data across 111 countries indicate that adults average 5000 steps/day. Using 90 steps/min as a medium walking pace for adults, which is close to the average step rate for the Teabag walk, replacing about 1100-1700 usual style steps (~22%-34% of total daily steps) with Teabag steps could be achieved in 12-19 min/day and would increase daily EE by approximately 100 kcal.

The small sample is a limitation. Still, every participant’s $V_O_2$ during the Teabag walk was at least 2.3 times greater than during their usual walk, supporting generalisability to most adults.

Our analysis seeks to empower people to move their bodies in more energetic—and hopefully more joyful—ways. People with disabilities, gait disorders, joint disease, or other health conditions might not be able to perform the Putey or Teabag walks assessed in this study, but they may be able to otherwise increase EE in their daily movements, with inefficiency as the goal.

Increasing the inefficiency of movement that we already perform could complement other public health efforts to promote regular physical activity in a joyful way. Efforts to boost cardiovascular fitness should embrace inclusivity and inefficiency for all.
Digital disparities in typing speed among healthcare workers

Alex R Schuurman, M E Baarsma, W Joost Wiersinga, Joppe W Hovius

Objective To investigate the typing skills of healthcare professionals.
Design Cross sectional study.
Setting Two large tertiary medical centres in Amsterdam, the Netherlands.
Participants 2690 hospital employees working in patient care, research, or medical education.

Main outcome measures Participants completed a custom built, web based, 60s typing test and filled out an associated questionnaire. Primary outcome was corrected typing speed (crude typing speed (words/min)×accuracy (proportion of correct characters in the final transcribed text)). Feelings towards administrative tasks were scored on the Visual Analogue Scale to Weigh Respondents’ Internalised Typing Enjoyment (VAS-WRITE).

Results Between 18 and 21 May 2021, 2690 participants (1942 (72.2%) <40 years old and 2065 (76.8%) were female) were recruited. Respondents’ mean typing speed was 60.1 corrected words/min (standard deviation (SD) 20.8; range 8.0-136.6) with substantial differences between professions and specialties, in which doctors in internal medicine were the fastest among the medical professionals. Typing speed decreased significantly with every age decade (rho -0.51, P<0.001), and people with a history of completing a typing course were >20% faster than those who had not (mean difference 12.1 words (standard error (SE) 0.77), 95% confidence interval 10.6 to 13.6, P<0.001). The corrected typing speed did not differ between genders. Women were less negative towards administration than men (VAS-WRITE score 7.68 (SE 1.17), 5.33 to 10.03, P<0.001). Medical staff reported the most negative feelings towards administration (mean VAS-WRITE score of 33.5 (SD 22.9)).

Conclusions Important differences were reported in typing proficiency between age groups, professions, and medical specialties. Specific groups are at a disadvantage in an increasingly digitalised healthcare system.

Introduction

Many administrative tasks such as writing medical notes, in addition to a typically high pressure work environment, makes typing a vital skill for medical workers. However, almost nothing is known about the typing proficiency of the medical community. We sought to investigate the typing skills of the healthcare community in two large university hospitals in the Netherlands.

Methods

We used a custom built, web based application to assess the typing speed among staff of two hospitals in Amsterdam, the Netherlands. We focused on staff working directly or indirectly in patient care, staff with medical administrative tasks, or people with tasks related to research or education.

After accessing the application through a URL on their own computers, respondents answered brief questions about their background, work, any formal typing training they might have had, and their administrative workload. Respondents were then asked to copy as much as they could of a short story about Santa Claus in the time frame of 60 seconds. Respondents could correct any errors within a word or in punctuation marks up to the moment of hitting the spacebar and starting a new word.

The primary outcome measure was the corrected typing speed, defined as crude typing speed (words per minute) multiplied by accuracy (correct characters as a percentage of total characters in the final transcribed text). A word was defined as five characters including spaces. We also assessed self-reported gender, age in decades, number of fingers used to type, and details on formal training in touch typing. Feelings toward administration were measured on the Visual Analogue Scale to Weigh Respondents’ Internalised Typing Enjoyment (VAS-WRITE).
Results

Between 18 and 21 May 2021, we collected a final dataset of 2690 test results. Mean crude typing speed of all respondents was 62.8 words/min (standard deviation (SD) 20.6) with a mean accuracy of 95.2% (SD 7.3). Mean corrected speed (typing speed) for all respondents was slightly lower at 60.1 words/min (SD 20.8; range 8.0-136.6).

We observed a striking, negative association between typing speed and age (analysis of variance P<0.001), underlined by significant differences between all but the two oldest age groups (oldest two groups not significant from each other, all other comparisons P<0.001; fig). Correlation analysis showed that the number of fingers used to type (rho 0.43, P<0.001) and age group (−0.51, P<0.001) were significantly associated with typing speed. After correction for age, various observed differences were substantiated. Employees working in research and education and members of the medical staff typed significantly faster than most other professions, while internal medicine outperformed microbiology, radiology, paediatrics, and the aggregate group of other clinicians.

Typing speed between women (n=2065) and men (n=620) did not differ significantly (mean difference 0.5 (standard error (SE) 0.9) words, 95% CI −1.4 to 2.4, P=0.61). Comparison of genders within each age group also showed no major differences, although men appeared slightly faster in age groups >30 years (only significant for 30-40 year olds, t test P=0.04). Overall, female respondents made significantly more typing errors (mean difference 5 (SE 1.75) incorrect characters, 95% CI 2.3 to 7.7, P<0.001), although they ostensibly compensated with more words corrected (mean difference 0.5 (SE 0.1) words, 95% CI −0.1 to 1.0, P=0.09) resulting in equal corrected typing speeds.

To explore the potential benefits of a typing course, we split our cohort between those who had completed a typing course and those who had not. Respondents who had done a typing course in the past used more fingers to type (median 10 (interquartile range 10-10) fingers v 6 (4-8) fingers, Wilcoxon P<0.001) and typed more than 20% faster than those that had not (mean difference 12.1 (SE 0.8) words, 95% CI 10.6 to 13.6, P<0.001), even though more than nine (90%) in 10 took their course more than 10 years ago. Notably, the age distribution between the two groups was similar.

Discussion

The difference in typing speed between internal medicine and specialties such as microbiology and dermatology could reflect the high pressure environment of working on a ward, which might necessitate faster typing, or that only fast typing employees select these fields.

Age was an important factor in the typing speed of our respondents. Younger generations have been interacting with technology from an early age, whereas the older generation, generally, were exposed to working with a computer only later in life. Digitalisation in medicine is a relatively recent phenomenon, and people of older age might have yet to fully adapt to this profound change.

We found important interdisciplinary differences and report that older healthcare professionals are at an overall disadvantage in an increasingly digitalised medical world. These data could inform the implementation of training modules to increase typing speed, and instigate alternative methods of data entry to resolve this imbalance.
**ORIGINAL RESEARCH** Pilot randomised controlled trial

**A Christmas themed physical activity intervention to increase participation in physical activity during Advent**

Gregory J H Biddle, James P Sanders, Kajal Gokal, Claire D Madigan, Jonah J C Thomas, Alexandra Pyle, Andrea Roalfe, CLiMB Active Advent Study Team, Amanda J Daley

**Objectives** To examine the recruitment, retention, and preliminary effects of a Christmas themed physical activity intervention designed to increase participation in physical activity and decrease sedentary behaviour in inactive adults.

**Design** Pilot randomised controlled trial.

**Setting** Social media platforms, workplaces, and community groups in the UK.

**Participants** 107 inactive adults, aged 18-75 years.

**Interventions** The intervention consisted of an email sent to participants 1-24 December, which contained a Christmas themed physical activity idea to be completed that day. Each activity idea was presented in three intensity formats, including Easy Elf (light intensity), Moderate Mrs Claus (moderate intensity), and Strenuous Santa (vigorous intensity). The comparator group received a leaflet about healthy living on 1 December.

**Main outcome measures** Participants were randomly assigned (2:1) to either the intervention or control. Primary outcomes were recruitment rate, retention, and weekly minutes of participation in self-reported moderate-to-vigorous intensity physical activity by use of the exercise vital signs questionnaire.

**Results** 323 individuals expressed interest in participating in the trial and 107 were randomly assigned to a group (intervention (n=71) or the comparator (n=36)). The recruitment target (n=105) was reached within 19 days of starting recruitment. 23 (21%) of 107 participants were lost to follow-up. At week 3, the adjusted mean difference between groups was 20.6 minutes of moderate-to-vigorous intensity physical activity per week (95% confidence interval −29.7 to 70.9) in favour of the intervention group.

**Conclusions** The public were interested to participate in a Christmas themed physical activity intervention, which might increase physical activity and reduce sedentary time.

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**WHAT IS ALREADY KNOWN ON THIS TOPIC**

- The festive period is known to be a time when people are less physically active and more sedentary, which might contribute to weight gain during this period.

**WHAT THIS STUDY ADDS**

- The public are interested to engage in a Christmas themed physical activity intervention during Advent.
- A Christmas themed physical activity intervention during Advent showed promise for increasing physical activity and reducing sedentary time among inactive adults.
primary outcomes of interest were the recruitment rate, percentage lost to follow-up, and minutes of participation in self-reported moderate-to-vigorous intensity physical activity per week measured using the exercise vital signs questionnaire.13

We aimed to recruit at least 105 participants: 70 allocated to the intervention group, 35 the comparator group. Based on previous research, we expected a 20% loss to follow-up in each group.19

Repeated measures linear mixed models were used to compare self-reported moderate-to-vigorous intensity physical activity and muscle strengthening activity between the groups at follow-up levels of more than 80%.19 23 24 These data highlight that the public are interested in taking part in Christmas themed physical activity events.

**Results**

A total of 323 individuals expressed interest in participating in the study during the recruitment period. The target was reached within 19 days of starting recruitment. On average, six participants consented per day. We consented 107 inactive adults, randomly assigning 71 to the intervention group and 36 to the comparator group. Data were missing for 23 (21%) of 107 participants for self-reported moderate-to-vigorous intensity physical activity at week 3 (end of intervention phase). Of these 23 participants, 16 were from the intervention group and seven were from the comparator group.

Most participants were women (88%), of white ethnicity (88%), and employed (87%). The mean age of participants was 46 years (standard deviation 12.9), and 56% were overweight or living with obesity.

On average, the intervention and comparator groups reported similar minutes of participation in moderate-to-vigorous intensity physical activity in weeks 1 and 2. At week 3, the adjusted mean difference between groups was 20.6 minutes of moderate-to-vigorous intensity physical activity per week (95% confidence interval −29.7 to 70.9) and 0.6 days per week (−0.1 to 1.3) of participation in muscle strength based physical activity, in favour of the intervention group.

**Discussion**

Recruitment to the trial was successful, achieving the stated target within three weeks. Although recruitment met the predefined target, more women than men were recruited, which is typical for lifestyle behavioural trials.22 Retention was successful, with only 21% of participants not completing follow-up. This figure is consistent with other lifestyle and behavioural trials, which typically report retention levels of more than 80%.19 23 24 These data highlight that the public are interested in taking part in Christmas themed physical activity events.

Both groups reported similar minutes of participation in moderate-to-vigorous intensity physical activity during weeks 1 and 2, although by week 3 the intervention group reported participating in more minutes per week (about 21 minutes) than the comparator group. If a future trial were able to replicate this difference, the results would represent an important finding because even small increases in moderate-to-vigorous intensity physical activity are important for reducing all cause mortality.25

Our findings show that the public were interested to engage in a Christmas themed physical activity intervention, which also reduced sedentary behaviour and showed promise for increasing participation in physical activity during the festive period.