Research

A cross-sectional study exploring the sitting time of afghans and other South Asian youth in the UK

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Abstract

Introduction Prolong sitting time (ST) contributes to obesity and numerous Non-Communicable Diseases including type 2 diabetes and cardiovascular diseases. Concerning evidence on young people's health has reported an increase in ST, the young British South Asians (BSA) is under explored. Thus, the aim of this study was to explore the ST of BSA community, specifically focusing on Afghans, Pakistani, Bangladeshi, and Indian groups.

Methods Young BSA from the UK West Midlands region (mean age 15.4 ± 0.5 years) (Total: n = 191, (females: n = 93; males: n = 98) participated in this study. ST was measured based on self-reported total sitting hours using The International Physical Activity Questionnaire—Short Form. Data were modelled using a Bayesian approach to determine differences in ST. **Results** The findings indicated that the majority of the BSA young people across ethnicities spent prolonged time being sitting. Young people from Indian ethnicity had the highest estimated marginal mean ST (482.23. 95% CI [410.49, 554.73]) and the Afghans the lowest estimated marginal mean ST (344.61, 95% CI [280.22, 411.33]).

Discussion This study emphasised a worryingly high percentage of young people from each BSA ethnic group spending prolong ST. To the authors' knowledge, this is the first study to explore and compare the inter-population differences in ST within BSA minority ethnicities, including Afghan population in the UK.

Conclusion The present findings provide a rationale for further scrutiny on key objective and qualitative determinants contributing to ST within different ethnicities among BSA young people.

Keywords Sedentary behaviour · Sitting · Physical activity · British South Asian · Young people · Ethnic minority · Health · Well-being

1 Introduction

The rise in sedentary behaviour (SB) among young people is a growing public health concern globally. Prolong sitting time (ST) is a component of SB that has been associated with obesity and Non-Communicable Diseases (NCDs) including type 2 diabetes (T2D) and cardiovascular diseases (CVD) [9, 53]. The prevalence of several NCDs associated with ST is increasing across the United Kingdom (UK) population groups, both in adults and young people [42, 43]. Among adolescents, extended periods of sitting are also associated with negative mental health outcomes, including heightened anxiety and depression [64].

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In England the number of people with T2D increased by 11.6% between 2017–18 and 2021–22. However, people under 40 years old and those in minority ethnic groups experienced a steeper rise of 18.7% [43]. Recent studies suggest ST is alarmingly prevalent among young people. The COVID-19 pandemic has further exacerbated this [36, 61]. Even before the COVID-19 pandemic, in Europe, 76.8% of adolescents aged 15–17 engage in high levels of ST (defined as over 4.5 h of sitting per day) [35]. Alongside SB, another common metric used to assess ST is screen time [11, 49, 50], with evidence on this metric also highlighting concerningly high levels of ST in young people [69]. For example, in the UK, 12–15-year-olds spend on average over 13 h of screen time per week on social media and over 11 h per week on gaming, TV and video streaming, highlighting an important shift towards sedentary lifestyles [47].

While high levels of ST are concerning across all populations, disparities exist between different ethnic groups [7, 16, 34, 37]. The BSA community, comprising individuals of Afghan, Bangladeshi, Indian, and Pakistani heritage, is particularly at risk. Members of the BSA community have a higher prevalence of NCDs and the health outcomes associated with ST such as obesity and T2D compared to the general UK population [1]. For example, in the UK, the BSA have a two-fold higher risk of heart disease compared to the general adult population [32]. However, NCDs related risks are becoming more prevalent in young people from Black, Asian and Minority Ethnicity (BAME) groups, as these are suggested to display higher prevalence of obesity and comorbidities including T2D, fatty-liver and CVD [2, 44]. Research has highlighted that BSA youth are less active than their white Caucasian counterparts [6, 58], with recent evidence indicating that Asian children and young people in England have the least positive attitudes towards physical activity (PA), and the joint lowest PA levels compared to other ethnic groups [62, 63]. Despite these concerning trends, research on ST specifically within BSA youth remains limited. Most existing studies focus on PA levels without adequately addressing ST or exploring intra-ethnic differences within the BSA community [51, 58].

Within the UK, BSA are one of the fastest growing and largest minority groups [48] and have been described as an 'important target population for public health efforts to reduce ST [16]. Despite the lack of evidence about ST patterns in BSA youth, a recent publication investigating their PA levels emphasised the importance of examining lifestyle behaviours among the various BSA ethnic groups [58]. The study identified differences between PA levels of Bangladeshi, Indian, Pakistani and Afghan youth, and inferred that these were likely influenced by differing social, cultural and religious beliefs between these diverse ethnic groups. The study also assessed PA levels of Afghan youth, who are a growing population within the BSA community and found that 88.5% of the Afghan youth were engaging in < 30 min of PA per day and boys were more active than girls [58].

Whilst BSA communities share certain cultural practices and religious traditions, nevertheless the existing approach of treating them as a homogeneous group in PA, SB, ST and health related interventions has been unable to gather the pertinent distinctions that could impact their health and wellbeing [52, 58]. For instance, regarding BSA communities as a homogeneous group could masks essential variances in ST and potential determinants including cultural norms, religious practices, generational differences between first-generation immigrants and British-born South Asians, gender-specific cultural expectations affecting movement patterns, and socioeconomic factors that vary across different BSA communities such as Afghan, Bangladeshi, Indian or Pakistani. To develop effective interventions or strategies targeting the ST or general health and wellbeing, there is a need for a nuanced approach of exploring the heterogeneity within BSA communities, reports findings separately across key demographic variables, thereby enabling the development of culturally tailored interventions that resonate with specific BSA subgroups and potentially lead to more effective strategies for reducing ST and improving health outcomes [26, 58].

Notably, the Afghan population within the BSA community has been under-represented in research, despite cultural and social factors that may uniquely influence their ST and PA behaviours. Safi and Myers [59] explored pertinent barriers to PA participation experienced by Afghans residing in the UK compared to those living in Afghanistan. Their results suggested that 'lack of time' and feeling 'too tired' as barriers by both populations but were rated higher by those living in Afghanistan. Afghan females perceived a lack of single-sex facilities, not being able to participate in PA with males, and having to be fully covered outside of the home as important barriers to their PA, but these were more of a barrier for those residing in the UK. Understanding these nuances is essential for developing effective, culturally sensitive interventions to reduce ST and its associated health risks.

Understanding ST in specific ethnic groups is crucial for developing targeted interventions to mitigate health risks associated with sedentary lifestyles. To build on such findings, similar research approaches focusing on ST within BSA youth are needed prior implementing PA and health related interventions. To the authors' knowledge, this is the first study to explore and compare ST of the young Afghan population. Therefore, the aim of this study was to explore and compare ST among Afghans, Bangladeshi, Indians, and Pakistani youths living in the UK. By examining these specific

ethnic groups, the research seeks to identify distinct patterns and contributing factors to ST and helping address a significant gap in the literature.

2 Methods

2.1 Participants and procedures

The data collection commenced after obtaining an institutional ethical approval. Participants were invited from different educational establishments across West Midlands, including secondary schools, community wellbeing centres, religious places such as Mosques or Gurdwaras, local community clubs and tuition centres to participate in this study. Participant information sheet, and individual and parental/legal guardian consent forms were distributed to all participants to obtain full consent. Participants were selected through purposive sampling, specifically recruiting youth from Afghan, Bangladeshi, Indian, and Pakistani ethnic backgrounds to align with the study's aims and objectives. In total (n = 191), female (n = 93) and male (n = 98) young BSA between the age of 15 and 16 years, provided individual and parental/legal guardian consent to participate in this study. Participants per ethnic groups: Afghans: n = 44, (females n = 18, males n = 26); Bangladeshi: n = 39, (female n = 20, male n = 19); Indian: n = 56, (female n = 28, males n = 28), Pakistani: n = 52, (females n = 27, males n = 25). The study sample is aligning with previous research and is broadly representative of these ethnic groups [58].

2.2 Measurement of sitting time

The ST of young BSA was measured through the International Physical Activity-Short Form Questionnaire (IPAQ-SF). The IPAQ-SF is one of the most valid and reliable tools that has been widely used in different countries with people of different culture and age groups [14, 25, 57, 70]. Previous research highlights IPAQ as one of the most user-friendly and cost-effective measurement and is reliable in assessing young people's ST and PA [28, 57, 60]. The IPAQ-SF ask about the specific type of activity engagement across three domains such as engaging in vigorous physical activities, moderate physical activities, walking type of activities and ST in the last 7 days. The frequency of data (measured in days per week) and duration (time per day) were collected separately for each specific type of activity, with total hours engaged in for an activity being the product of the frequency and duration reported as outlined in [58]. The data collection period was one month, during the UK academic school summer term, across various educational and local institutions. The lead researcher explained the purpose of the research and provided instructions on how to complete the questionnaire prior to distribution. Participants had the opportunity to ask questions prior completing the survey then IPAQ-SF was distributed during lessons, activities, and pre/post prayers at the different establishments and the lead researcher was present whilst participants completing the survey to offer additional support as required. In addition to measuring the ST of BSA youth, the moderate to vigorous PA (MVPA) data was also collected via the IPAQ-SF, which was then analysed and published [58].

Descriptive statistics included median and median absolute deviation (MAD) for ST. Inferentially differences were modelled between BSA groups using a Bayesian approach, fitting models in software R [65] with the Bayesian Regression Models using the Stan package [10]. Bayesian models are highly flexible, provide direct probabilities of differences, and help avoid some misunderstandings and assumptions of traditional p-values and confidence intervals [68]. Importantly, for the present study, this type of analysis does not require a randomised sample selected from the population of interest.

To facilitate straightforward comparisons between the young BSA groups, the results report Estimated Marginal Means (EMMs) for each regression model. While descriptive statistics focus on the median to account for data skewness, EMMs from Bayesian regression models provide an integrated estimate derived from the posterior distribution modelled. In this analysis, skew-normal models were identified as the best-fitting models using Leave-One-Out Cross-Validation [67], which evaluates predictive accuracy. By modelling EMMs the estimates reflect the central tendency of the skew-normal distribution, capturing both the location and the asymmetry inherent in the data. Theoretical works such as [4, 5] confirm that the mean is a more representative measure of central tendency for skew-normal distributions and posterior EMMs integrate over parameter uncertainty offering a nuanced and model-consistent summary of the best fitting distribution [22, 39].

For each model of the differences the prior used for the intercept (α) was a student-t distribution with 3 degrees of freedom (v), the location parameter (μ) as the median of the response variable, and the scale parameter (σ) as the median



absolute deviation of the response variable. For β , the prior was a wide normal prior (μ , σ). The BSA group was fitted as a categorical predictor, using the Afghan group as the reference category (see Eq. 1).

$$Y \sim N(\mu, \sigma^2)$$

$$\mu = \beta_0 + f(X) + \beta_1 Ethnicity$$
(1)

Instead of removing potential outliers for each model, for modelling differences in ST, we included a prior that placed less probability on extreme values, which was centred on zero with a large standard deviation, resulting in a weak informative normal distribution. We fitted different response distributions for each dependent variable and made model comparisons using Leave-One-Out Cross-Validation (LOO-CV) to determine the best model. The skew-normal distribution consistently provided the best fit. Additional models with gender as a predictor were also fitted.

The relationship between ST and MVPA was explored using normal, polynomial, and thin plate spline response distributions. The thin plate spline model, selected through LOO-CV, offered the best out-of-sample predictive accuracy. Gaussian processes regression was also carried out, which, although insightful, showed high uncertainty and poor chain mixing, suggesting caution in interpreting the results.

In terms of effect sizes, it was calculated that the probability of an effect above zero as the proportion of the posterior distribution of the median's sign. It was also computed that the probability of a difference exceeding a standardised difference of 0.254, corresponding to Cohen's U3, where 60% of the group with the higher estimated mean value were above the mean of the comparison group—slightly above Cohen's "small" effect. To facilitate straightforward comparisons between the young BSA groups, the results include reported estimated marginal means for each regression model.

3 Results

The descriptive statistics suggest that individuals in the sample with Afghan heritage had a median ST of 150 min (MAD = 222.390), Bangladeshi heritage 300 min (MAD = 333.585), Indian heritage 465 min (MAD = 229.803), and Pakistani heritage 390 min (MAD = 400.302). While the group with Indian heritage had the highest median ST duration and Afghans the lowest, the values show considerable variability within each ethnic group (see Fig. 1).

3.1 Inferential statistics

The best fitting inferential model, controlling for extreme values, suggests a similar pattern, those with an Indian heritage, on average, having the highest ST, with those of an Afghan heritage having the lowest, although there was considerable overlap across the 95% credible intervals (see Table 1).

The results of pairwise comparisons of the estimated marginal means show some high probabilities of differences in ST between various ethnic groups (see Table 2). For example, the comparison between those of Afghan and Indian heritage shows a very high probability of an effect above zero and a difference exceeding a standardised difference of 0.254. Similarly, the Afghans and Pakistani comparison also shows a high probability of an effect and a standardised difference. Comparisons involving Bangladeshi and Indian groups also show high probabilities, with the probability of a difference exceeding 0.254 for these comparisons remaining similarly high. Other comparisons did not exceed a 90% probability.

The estimated marginal means and 95% credible intervals from models including gender as an independent variable across different BSA ethnic groups, show a general trend of higher sitting times among those of Indian and Pakistani heritage compared to Afghans and Bangladeshis. For both males and females, Indians exhibited the highest estimated ST, while Afghans showed the lowest. The credible intervals suggest gender differences in sitting time are not pronounced, as there is considerable overlap between genders within each ethnic group. However, the credible intervals for the Indian and Pakistani groups were wider, reflecting greater uncertainty and variability in sitting times within these groups (see Table 3).

Looking at the relationship between ST and MVPA, the best fitting model suggests a non-linear relationship between these variables. At lower levels of MVPA (up to approximately 200 min), ST remains relatively stable. However, as MVPA increases beyond this point, there is a notable increase in ST. This shows that individuals who engage in higher amounts of MVPA also have higher ST. This trend becomes more pronounced as MVPA exceeds 400 min (see Fig. 2).



Fig. 1 Median and beeswarm plot of individual sitting times

Table 1Estimated marginalmeans and 95% credibleintervals for ST per day fordifferent BSA ethnic groups

Ethnicity	Estimated mean	95% HDI
Afghans	344.61	(280.22–411.33)
Bangladeshi	385.92	(313.07–450.79)
Indian	482.23	(410.49–554.73)
Pakistani	429.05	(370.07–486.28)

Table 2The probability ofan effect above zero and theprobability of a differenceexceeding a standardiseddifference of 0.254

Pairwise comparisons	Probability of an effect (%)	Probability of a difference > 0.254 (%)	
Afghans–Bangladeshi	83.25	83.08	
Afghans–Indian	99.90	99.90	
Afghans–Pakistani	98.83	98.83	
Bangladeshi–Indian	98.45	98.45	
Bangladeshi–Pakistani	86.67	86.52	
Indian–Pakistani	89.90	89.85	



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Table 3 Estimated marginal means and 95% credible intervals for ST for male and females for different BSA ethnic groups

Ethnicity	Male		Female	
	Estimated mean	95% HDI	Estimated mean	95% HDI
Afghans	341.87	(243.10–437.47)	342.97	(257.62–423.89)
Bangladeshi	397.23	(288.97–500.87)	375.85	(280.06–458.99)
Indian	506.39	(410.51–597.18)	471.08	(378.16–562.05)
Pakistani	432.27	(346.71–513.92)	432.16	(348.38–508.89)



Fig. 2 The non-linear relationship between ST and MVPA

In Fig. 2, the light blue lines, which represent the credible intervals, highlight the uncertainty in the model predictions. The increasing spread of these lines at higher levels of MVPA suggests greater variability in ST among individuals with high MVPA.

4 Discussion

The main finding of this study is that young BSA are considered sedentary irrespective of ethnicity which suggests that preventative health interventions on sedentariness are needed across all age-groups and all UK minority ethnicity populations. However, considerations of within-ethnicity ST would help to appropriate such interventions. The findings showed that young people from Indian heritage reported to be spending the longest ST and those with an Afghans heritage



the lowest per day. Previous research indicated that the average weekly MVPA levels were higher in Indian and Pakistani youth compared to Afghan and Bangladesh youth [58]. There seems to be parallel findings between the higher volume of MVPA engagement, and higher amount of ST. The ST among genders across BSA ethnicities revealed that Indian males and females, demonstrated the highest ST, while Afghans showed the lowest. This suggest that ST is highly prevalent among BSA irrespective of genders within each ethnic group. Higher ST among BSA found in this study, is likely to be a contributing factor to the higher prevalence of NCDs among young BSA and other BAME communities compared with "White" counterparts [44]. Previous literature has supported the separation of individual ethnic groups when exploring PA behaviours [58], however there is little research which focuses on ST according to individual ethnic groups.

Therefore, research exploring ST focusing on drawing comparisons across backgrounds, should consider inter-ethnicity differences across BSA communities to explain the associated NCD risk factors with ST. Such understanding contributes to reducing population disparity in ST and associated health risks such as obesity and NCDs through targeted community-based interventions, to health policy development [2]. The present study extended previous findings indicating those from Afghan and Bangladeshi backgrounds, engaged in least MVPA [58], and highlight, Afghan and Bangladeshi community also engaged in the least amounts of ST. This indicates that these populations may spend greater durations of time engaging in light PA (LPA). In contrary to this, those from Indian and Pakistani communities have previously shown to engage in greater amounts of MVPA [58], however, this paper indicates that members from these backgrounds also engaged in the highest amounts of ST, and the greatest probability of effect was shown between Afghan-Indian community (99.9%), and the Afghan-Pakistani community (98.83%). This supports previous literature highlighting that the BSA young people engage in insufficient amounts of MVPA [17, 52, 58], this may be due to the ethnic groups spending longer durations of time in other intensities, including ST. However, literature suggests, children and young people compensate for increased levels of PA with additional time spent sitting [23, 55]. This therefore could be another explanation for Indian and Pakistani cohorts engaging in greater ST, despite also engaging in highest amounts of MVPA [58].

The National behaviour trends in UK suggest those from ethnic backgrounds continue to be most physically inactive compared to their white counterparts [30, 62, 63]. When exploring regional differences across the country, those from BSA backgrounds were less likely than average to be physically active in all regions except for the North East and South West of England [15]. This highlights the consistency in regional lack of BSA PA, and consequently increased ST. Additionally, when investigating BSA PA and ST according to socio-economic group, the BSA communities were less likely to be physically active than the average for every socio-economic group (except the long-term unemployed group) showcasing that socio-economic status proves to cause differences in PA behaviour across ethnic groups [15].

Minority-ethnicity groups within high-income countries (HICs) often share lower socioeconomic status, health deprivation, which negatively impact their health outcomes and quality of life. Epidemiological analysis of population distributions across England reported Pakistani, Bangladeshi and BAME in the lowest decile of deprivation [13]. However, socioeconomic status and associated health outcomes within UK's Afghan populations are less understood, perhaps due to a different underlying risk factors primarily migration-related health determinants explained elsewhere [38]. Furthermore, the WHO-STEPS survey reported high levels of sedentariness and low PA levels among Afghan population [54], which may explain lifestyle nutrition and PA predisposing factors in country of origin that adds to those already existing within HICs, especially in youth [18]. In children and adolescents, lifestyle nutrition and PA interventions if are culturally appropriated and co-produced with the specific community are most effective in minority-ethnicity populations [45]. Thus, the present findings can be used as a framework to co-produce the culturally appropriate health related interventions.

Previous research has identified that many health related issues including obesity prolong SB, excessive energy intake and insufficient PA engagement is associated with unhealthy lifestyles that could continue from childhood to adulthood [29]. Children or young people with unhealthy behaviour including prolong ST are five times more likely to be obese in adulthood [24]. Given the current findings demonstrating that young BSA spent worryingly high volume of ST especially those of Indian and Pakistani heritage and as reported in the previous study conducted by Safi et al. [58] concluding that most BSA young people failed to meet the recommended MVPA guidelines of 60 min per day, with most achieving less than half the daily guidelines (80%) provides a rational for further research, to identify the key determinants of ST and PA behaviour within these inactive minority-groups and establish a culturally tailored interventions to target this age group within schools, worship places and communities to reduce the ST and increase PA engagement. Targeting this age group is vital because schools, worship places and communities could facilitate the culturally tailored interventions which in turn could help reduce the ST and increasing PA which could lead young people to develop a healthy and active lifestyle from young age and in turn could positively contribute to the health and wellbeing at a later stage. For instance, evidence suggest that people from the South Asian communities living in the UK have higher rates of obesity and T2D compared to others [19]. Furthermore, according to



Youth Sport Trust [71] and Sport England [62, 63] annual report suggesting that children from the ethnic minority such as Asian backgrounds are consistently less likely to be active. Therefore, BSA targeting from the young age with tailored health and wellbeing related interventions could help them develop a healthy and active lifestyle and in turn this could contribute to reducing the risk of obesity, T2D and other health condition related to prolong ST and insufficient PA engagement.

Schools, worship places and communities should also consider accommodating tailored health and wellbeing related interventions for BSA parents as this will help increase parents awareness about the importance of reducing ST and improving PA engagement which in turn could help young BSA in academic achievement, long term health and wellbeing. For instance, previous research suggested that BSA young people reported that their parents encouraged them to focus more on all other academic subjects and pay less attention to physical education (PE) and PA also BSA young people reported that their parents do not support them to take part in PA [12]. Furthermore, the attitude of BSA people is generally negative towards PA and health related initiatives and one of the potential contributing factors to this is mainly because of their parents who has lack of knowledge or education about the importance of health and wellbeing. Research suggested that parents could influence PA, SB of their children through role model-ling such as participating in health-related initiatives, providing financial support and encouragement [21, 40, 56].

The socioeconomic status, have both positive and negative effect and studies has shown that people from lower socioeconomic status are tend be less active compared to the higher socioeconomic status [20, 41]. BSA groups are in the higher levels of unemployment, experience less social mobility, have lower income and are likely to live in areas of high deprivation. Research has suggested that children and young people from lower socioeconomic status are less likely to participate in PA, sports clubs and more likely to spend over two hours a day of screen time which further contribute to the already prolong ST [41]. The BSA young people parents may not be able to afford health and wellbeing related initiatives that require payments thus tailored health and well-being related interventions are required to target this group to reduce ST and improve PA which in turn may positively contribute to the health and wellbeing [30, 31, 33]. Recent findings in the North East of England showed there is a dichotomy between what the health authorities propose as an action, compared with what the BSA and BAME communities experience and perceive as a necessary action on their lifestyle change including ST [45]. Therefore, the present findings aligns and support existing literature in regards to young BSA spending prolong ST and contributes to the scarce literature and can inform health promotion initiatives that seek to improve public health specifically targeting BSA young people's health and wellbeing [58].

Further research has also identified some barriers to PA specific to female from ethnic minority groups [3, 8, 30, 58], where no BSA females who identified as Afghan, Bangladeshi or Pakistani met the daily PA health guidelines [58]. Reasons behind these findings could attribute to cultural expectations that BSA female are 'homemakers', and consequently, felt that their lifestyle meant that they were already physically active or pursuing PA would be a hindrance to this role [30]. There is also evidence suggesting that a sample from ethnic groups perceived certain forms of exercise as culturally inappropriate, such as dance activities, and this could potentially endanger personal modesty [30]. Combining these factors alongside religious ideologies from the Sikh and Islamic faith, where mixed-gender PA is prohibited, interventions should target young people and their parents to accommodate for their cultural and religious needs.

Although this study contributes to the scarce literature across BSA ethnicities, but it is not without limitations. For instance, this study merely focused on the differences and similarity between young people ST across BSA ethnicities within the UK (West Midlands) region, findings are reflective of the specified geographical areas and focused on young people's ST. While this study provides the basis for differences and similarities between BSA young people ST, it does not explore the potential reasons behind it. Therefore, future research may wish to focus on the different lifestyle factors including socio-economic status, nutrition intake, Body Mass Index and PA that could contribute to the ST and more broadly SB including exploring the potential reasons qualitatively. Another limitation of this study was the self-report measure used to capture the ST. Self-report measures can be subject to bias, particularly social desirability bias, where participants may under/over-report ST or PA. This bias may vary across different ethnic groups due to the cultural norms and expectations, potentially skewing the data and misrepresenting actual behaviour patterns. However, it is worth noting that many cultural practices are shared across these ethnic groups, which might mitigate some of the differences in reporting tendencies. Future longitudinal study with objective measures such as accelerometers of ST could provide more accurate data.

5 Conclusions

The present study reveals that ST is alarmingly high among BSA young people, particularly those of Indian and Pakistani heritage. Despite higher engagement in MVPA among Indian and Pakistani groups [58], these youths also exhibited greater ST. This paradox suggests a compensatory relationship, where increased PA does not necessarily equate to reduced ST [23, 55]. The findings provide a rationale for further scrutiny, to explore the key factors contributing to the prolong ST within the BSA young people across different ethnicities. Spending prolong time being sitting across BSA groups may contribute to health risks such as T2D and obesity in those communities. These results underscore the need for comprehensive public health strategies that address both PA promotion and strategies to reduce ST. Interventions should be culturally sensitive and tailored to the specific needs of each ethnic group. The present findings recommend BSA and/or other ethnic minority groups to consider reducing ST and engage in more PA for a healthy and active lifestyle. These findings support the need for further PA and ST research in BSAs according to individual ethnic group, particularly with growing UK-based Afghan population who are currently under-researched group. Future research should build on these results by employing longitudinal designs and incorporating objective measures of ST, such as global positioning systems, pedometers and accelerometery to track and monitor PA and ST. In addition, qualitative studies exploring the underlying reasons for high ST in certain ethnic groups will provide valuable insights for developing effective, tailored interventions to reduce ST and improve health outcomes among BSA young people.

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Data availability The datasets generated and/or analysed during the current study are not publicly available but can be obtained from the corresponding author Dr Ayazullah Safi: ayazullah.safi@bcu.ac.uk—upon reasonable request.

Declarations

Ethics approval and consent to participate This study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Newman University Ethics Committee (Project ID number: 2015-12-08-1304075/2330).

Informed consent Informed consent was obtained from all subjects, schools, worship places and/or participants legal guardian(s).

Competing interests The authors declare no competing interests.

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