

The use of public sports facilities by the disabled in England

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Abstract: Disabled sports participants are a small proportion of sports participants at English public sports centres; but they are important to the social inclusion agenda. This paper aims to provide a detailed insight into the preferences and behaviour of disabled sports participants. It investigated whether there were statistical differences: first, between the disabled sports participants and the non-disabled sports participants in terms of (1) social demographics, (2) patterns of participation, (3) travel, (4) sports activities and (5) customer satisfaction; and second, between age, ethnic, socio-economic and gender groups of their subsamples, on (2), (4) and (5) again. Disability is defined as having any long term illness or health problem which limits a person's daily activities or the work that a person can do. The data collected through the National Benchmarking Service, for 458 sports centres from 2005 to 2011, revealed that about 9% of over 150,000 sports participants were disabled. Swimming, using fitness equipment and keep fit related exercises were the top three most frequently stated main sports activities by the disabled. It was also more likely for the disabled to participate in organised activities, own a leisure card and participate regularly when compared with the non-disabled participants. In addition, the disabled were also more likely than the non-disabled to travel to the centre by public transport, from home and travel a longer journey time. The industry weaknesses as identified by the disabled relate to physical evidence of the sports centres, particularly cleanliness attributes. Measures that can be taken to increase sports participation by the disabled include competent support at sports centres, promotions through discount schemes or leisure cards, and free transportation to sport centres in catchment areas with high proportions of disabled in their population.

The Use of Public Sports Facilities by the Disabled in England

Introduction

This paper aims to provide a detailed insight into the participation patterns and satisfaction of disabled sports participants by a) testing whether there are statistical differences in terms of customer demographics, participation patterns, travel and sports activities for the disabled and the non-disabled, b) assessing patterns of participation by their demographic profiles, and c) identifying what may have affected disabled visits to the sport centres from the perspective of various service attributes at the sport centres, by identifying areas of dissatisfaction.

Context and Rationale

Visits by the disabled are important to the social inclusion policy agenda for English sports facilities as indicated by Sport England, the main government agency for sport in England, which set out guidance notes for the design, operation and maintenance of sports facilities to allow access for all disabled people to facilities and programmes that meet the needs of disabled people (Sport England, 2010a). Sport England is currently investing £2.6 million in disability sport and has awarded £1.5million to the English Federation of Disability Sport (EFDS) over a three-year period to accelerate strategies in order to increase the number of disabled people playing sport and make grassroots sport more inclusive (Sport England, 2011). In addition, Sport England has increased the Inclusive Sport fund, as part of the Places People Play initiative, from £8 million to £10.2 million in order to achieve a growth in sport participation by the disabled (an outcome sought by Sport England Strategy 2013-17) by providing more sporting opportunities to disabled people across England and helping to overcome some of the barriers that may have hindered their sport participation (EFDS, 2012a; EFDS, 2012c; Sport England, n.d.). Participation in sports has been linked to a range of physical, social and mental health benefits which are beneficial to people who are disabled

physically or intellectually, as it has the potential to promote the social inclusion of disabled people and increase their self-esteem (EFDS, n.d.(c); Liu, 2009; Rankin, 2004; Robertson & Emerson, 2010; Sport England, 2005; Yazicioglu, Yavuz, Goktepe, & Tan, 2012).

Participation can provide the context within which people exceed the expectations associated with their disability through demonstrations of physical skills or fitness, so emphasising an alternative, more positive, picture of the body and the self (Sport England, 2001).

The main provision for sport in England is public sport facilities. Hence this paper utilises data on over 150,000 sport participants at 458 sports centres over a 6-year period from 2005 to 2011 to examine the sport participation of the disabled in these public sector facilities. These data were collected as part of Sport England's National Benchmarking Service (NBS) and did not identify exclusive disabled sports or centres which have been adapted for use by the disabled. NBS is a service commissioned by Sport England that offers sports facilities an opportunity for a health check of their service delivery in terms of a range of key performance dimensions including: access (use by specific market segments), finance, utilisation (overall throughput) and customer satisfaction. Whilst the NBS has been widely used as the basis for examining a range of performance management issues around public sector sports facility provision, the considerations of sport participation and customer perceptions of the disabled have been largely focussed on an aggregate level. In several studies using the NBS data (e.g., Liu, 2009a; Taylor, Panagouleas, & Kung, 2011), disabled participants were studied as part of user sub-groups, including disadvantaged leisure card holders, disabled under 60 years old and disabled 60 years and above. One of the objectives of this paper is to share some insights into the patterns of participation and demographic profiles of disabled sport participants, as well as the levels of satisfaction associated with their experiences at public sport centres.

Sport Participation by the Disabled

Different literatures may define disability in slightly different ways. Some researchers (e.g., Morris, 1993b and French, 1993, as cited in Kolkka & William, 1997, p.10) claimed that to experience illness, pain and the frailty of the human body is to experience disability in everyday life. The Active People Survey (APS) defines disabled people based on the social model of disability. This includes people with a long standing illness, disability or infirmity which affects their ability to go about daily activities (EFDS, n.d.(c)). This is identical to the definition used in the NBS. Disability is defined in the NBS user survey and this research paper as having any long term illness or health problem which limits a person's daily activities or the work that a person can do.

There were almost 11 million disabled people in the UK and around 9 million in England (Office for Disability Issues updated Department for Work and Pensions estimates based on Family Resources survey 2009/10 as quoted on EFDS (n.d.(b))). According to EDFs (2012c), 18 per cent of disabled adults aged 16 and over played sport once a week for 30 minutes. Sport England's Active People Survey 5 in 2010/11 revealed that 7% (640,600) of the disabled adults (aged 16 and over) participated in a sport regularly (i.e., at least three times a week for 30 minutes at moderate intensity generally). This represented a significant 0.3% increase on Active People Survey 2 and a significant 0.5% increase on Active People Survey 4 (EFDS, n.d. (a)). Similarly there was a significant 1.5% increase in the once a week sport participation for 30 minutes by disabled people in Active People Survey 5 compared with Active People Survey 4. The rate of non-participation in sport at least once in the last month for the disabled (77%) was much higher than the non-disabled (54%) in Active People Survey 5, although there were significant decreases (1.6% and 2.5% respectively) compared with Active People Survey 2 and Active People Survey 4. Sport centre usage by disabled under 60 year olds, irrespective of whether they were sport participants or not, declined

slightly between 1997 and 2006 according to a study on key access groups by Taylor et al. (2011). The proportion of visits to sport centres by the disabled has always been under-represented in comparison to their proportion in the catchment area population - Taylor and Kung (2010) revealed that the median representativeness scores for disabled aged under 60 years old and disabled aged 60 years old and above, for the 4 year period from 2005 to 2009, were only 0.71 and 0.30 respectively (a score of 1 is representative).

A downward trend for the regular participation in sport has been observed as age increases, disregarding participants' abilities (EFDS, n.d. (c)). Collins (2003) claimed that exclusion among older people came from poor health, poverty and disability, all of which might be compounded by isolation and poor mobility. Regular participation in sport by the disabled is lower across all age groups than participation by the non-disabled, and participation by disabled females is lower than that of disabled males amongst all age groups, particularly for young adults aged 16 – 19 years (EFDS, n.d.(a) & (c)). Thierfeld and Gibbons (1986) believed that one of the reasons contributing to the lower participation of disabled female adults in sports was that less encouragement was given to the disabled females to be active in sport in their childhood than disabled males. Sport England's (2001) research showed that a significant proportion of young disabled people considered themselves to be restricted to participate in sport by their health condition or disability, along with financial constraints and problems with transport. Meanwhile the younger focus groups in Rankin's (2004) research claimed that their opportunity to take part in sport ended when they left school due to lack of awareness of sporting opportunities. Rankin (2004) also revealed that the disabled were frustrated by the lack of sports opportunities that met their communication, access or impairment related needs to some extent. The three main areas of barriers in sports participation for the disabled were 1) physical barriers which included facilities, equipment and health and safety restrictions; 2) logistical barriers which included

geography, expense, support of others, communication and suitability, and 3) psychological barriers which included attitudes, opinions and perceptions of the disabled (EFDS, 2012b; Rankin, 2004).

Participation in sport has been associated with some personal characteristics and indicators of socioeconomic status and it cannot be assumed that the material conditions of impairment or disability, or high support needs, are the only major obstacles to sport participation by the disabled (Kolkka & William, 1997; Robertson & Emerson, 2010). According to Robertson and Emerson (2010), people with intellectual disabilities were less likely to take part in sports if they were socioeconomically disadvantaged, e.g., being poor, living in more deprived neighbourhoods and feeling unsafe in the area where they lived. The opportunities and limitations of leisure participation were related to income and occupational status, and poverty was the core of social exclusion (Collins, 2003; Kelly, 1996).

EDFS (2012b) claimed that the most influential barriers were psychological barriers, such as disabled people's personal impression of sport and non-disabled people's attitudes towards disabled people's ability to play sport, which resulted in a lack of awareness and opportunities for disabled people. In addition, a lack of confidence and self-belief could prevent disabled people from trying sport or physical activity, while non-disabled people felt uncomfortable supporting disabled people to take part. Sport England (2002) indicated that more needs to be done to provide people with a disability with credible information on the sports and physical activities that they might be able to do, given the nature of their disability, without unduly limiting their horizons.

According to EFDS (n.d. (c)), the five most participated once-a-week sports for the disabled people have remained the same since Active People Survey 2; in Active People Survey 5, these were swimming (4.75% of disabled adults), cycling (1.92%), football (1.25%), golf (1.08%) and athletics (0.90%). Disabled people were much less likely than non-

disabled people to play sport as a club member, or to have received sports tuition or coaching, according to Active People Survey 3 in EFDS (n.d. (a)). It will be interesting to identify whether similar patterns of participation are exhibited at public sector sport facilities specifically.

Customer Satisfaction

The customer is the ultimate judge of the adequacy of public sector leisure provision, so it is important to ensure the preferences of customers are considered while determining the provision of services (Guest & Taylor, 1999). Meanwhile, satisfaction is an outcome of service quality, which has a direct effect on future intentions of customers; and perceived value is a direct mediator of satisfaction in a sports and leisure centre context (Brady & Robertson, 2001; Murray & Howat, 2002; Taylor & Baker, 1994). Lentell (2000, p. 2) suggested:

Our willingness to return to a service provider, or to recommend it to our friends, can be critically affected by factors such as the robustness of the bookings system, the promptness of the service delivery, the way we are treated by staff, or by the cleanliness of the service outlet.

Liu, Taylor and Shibli (2008) suggested treating disadvantaged groups as heterogeneous, in order to address the issue of social inclusion for public sport facilities in the UK, since different customer groups placed different emphasis on specified service dimensions. Segmentation is generally defined as "the process of dividing a large, heterogeneous market into more homogeneous groups of people who have similar wants, needs, or demographic profiles, to whom a product may be targeted" (Mullin, Hardy, & Sutton, 2000, p.102). According to Liu et al. (2008), physical evidence (e.g., cleanliness) was vital to facilities aiming to increase the access of older, female or unemployed customers whilst the non-physical evidence (e.g., staff) needed to be emphasised for facilities hoping to

attract more adolescents or ethnic minorities, since they tended to be less demanding of the physical evidence. Liu et al. (2008) did not identify the attribute priorities of disabled participants.

Using NBS data, Liu et al. (2008) revealed that 60% of customers were more concerned about the physical evidence and only about 7% of customers placed relatively higher importance on the non-physical evidence. Furthermore, physical evidence was considered to be the most important to customers in Lentell's (2000) investigation of customer satisfaction at seven local authority-owned indoor leisure facilities in the UK during the period 1996–1997, and he recommended that improving the tangibles may be the most effective tactic in order to secure better customer satisfaction with public leisure services.

Service attributes of sport facilities.

Several studies have suggested that service quality measurement should be tailored to the context being examined and more information on factors affecting the perceptions of value (the direct mediator of satisfaction) should be obtained (Cronin & Taylor, 1992; Johnson, Tsiros, & Lancioni, 1995; Murray & Howat, 2002). Lentell (2000) suggested that the '3Ps' (physical evidence, process and participants) model by Booms and Bitner (1981) could be used to outline the major service dimensions of sport facilities. 'Physical evidence' comprises the facility itself and the equipment in it (e.g., the activity areas, equipment in them, and support areas such as reception and changing areas). 'Process', such as bookings, tuition of a class or serving customers in the bar / cafeteria, is directed at customers and requires their active participation. 'Participants' includes all service personnel who have contact with customers. Meanwhile, Grönroos (1984) proposed that two aspects of service dimensions are assessed when making service quality evaluations; these are the technical dimension which is associated with what is actually provided, and the functional dimension which relates to the way it is provided.

The CERM model, developed by The Centre for Environmental and Recreation Management (CERM) at the University of South Australia, focuses particularly on public sports and leisure centres. The CERM model assesses the extent to which customer are satisfied with 15 core attributes, with respect to their expectations. The CERM 15 core attributes are grouped into four dimensions: ‘core service’ (programme information, start/finish time, activity range, organisation, facility comfort, value for money and equipment quality); ‘staff quality’ (staff responsiveness, staff presentation, staff knowledge and officials); ‘general facility’ (safe parking and facility cleanliness) and ‘secondary service’ (food/drink and child minding) (Howat, Absher, Crilley, & Milne, 1996). There is a concern with CERM model measurement of the quality of services with reference to the customer's expectation - the ambiguity occurs when customers indicate their expectations, i.e. customers may not discern a difference between a ‘desired level’ and an ‘existing level’ of services (O’Neill and Palmer, 2004; Burns, Graefe & Absher, 2003).

NBS assesses the customer satisfaction with 19 service attributes of the sport centre, as well as how ‘important’ these attributes are to them. These enable the identification of areas of weaknesses and strengths in terms of service attributes and their importance to improving the service quality (O’Neill & Palmer, 2004). These attributes cover 5 broad service dimensions: accessibility, quality of facilities/services, cleanliness, staff and value for money, and the overall satisfaction with their visit. The determination of service dimensions and attributes in the original NBS framework was made through consultation with industry representatives. A comparison of the NSB service dimensions and attributes with the above mentioned service quality models in Table 1 shows that these dimensions and attributes are broadly consistent with the various basic principles of the frameworks discussed. NBS measures the customer satisfaction as well as their priorities for a wide range of service

attributes that are deemed relevant to public sport centres, and hence is appropriate for the analysis of this paper.

[Table 1]

Methodology

Participants

Only sport participants (i.e., excluding all spectators and non-sport participants) were included in the analysis of this paper as they were the focus of the study. The dataset with which the analyses were computed comprised of over 150,000 sport participants at 458 public sports facilities, who participated in the National Benchmarking Services (NBS) over the years 2005 to 2011. The public sports centres were defined in this context as swimming pools, sports halls and multi-purpose facilities which provided wet and/or dry activities, in some cases including outdoor activities.

Research Instrument

The NBS user surveys were conducted using a systematic sampling method over a standard period of nine consecutive days, normally including two weekends and at normal periods of operation. The user questionnaires were either administered by the interviewers (mostly from market research companies) or self-completed by customers, after their activities to capture information on their experience. Interviewers are advised to be neutral during the interview and to not signal the desirability or expectation of a particular answer. Other tests on NBS data had previously confirmed that there were no significant differences between the responses from the two most common types of NBS user survey administration - professional market research and in-house administration. User survey data was filtered or corrected prior to analysis, using the information provided by the centre's management in a financial/management survey, and by cross-referencing the questions in the user survey, to increase the reliability of the sample data. For example, if the centre did not have a sports

hall, but a gym, then responses for the satisfaction and importance of the sports hall attributes were amended to 'not applicable', as respondents might have recorded their experience of the gym in these hall attributes. Also, if a centre did not have a swimming pool and there were responses in the user survey indicating swimming, then these questionnaires were voided.

The results derived from the NBS user sample were subjected to fluctuations of $\pm 1.0\%$ or less at 95% confidence level, or $\pm 1.5\%$ or less if the sample size was halved (Veal, 2006).

Analyses of customer profile, participation and the satisfaction and importance scores for service attributes were derived from the user survey. Both importance and satisfaction were measured using a 5-point Likert scale, with 1 being low and 5 being high.

Analysis

For the purposes of this paper, the whole sample was segmented into the disabled and the non-disabled, in order to identify whether there were differences between the two groups. The statistical tests were mainly computed using IBM SPSS Statistics 20. Statistical tests, which included the chi square test, Z test for the equality between two proportions or the column proportion tests, the independent sample T-test and the Analysis of Variance (ANOVA), were used to identify any statistically significant differences between the non-disabled and disabled in respect of (1) their demographic profiles, (2) their participation patterns, (3) their travel patterns, (4) their sports activities and (5) their satisfaction and importance scores for NBS service attributes. Then within the disabled sub-sample, the age, gender, ethnic, and socio-economic groups variables were tested again on (2), (4) and (5). A satisfaction and importance grid analysis of the NBS service attributes for the disabled was drawn to identify the least satisfied service attributes as well as the most satisfied service attributes, taking into account the importance attached to these attributes. This grid analysis was repeated for the non-disabled in order to uncover whether the industry strengths and weaknesses were similar for both groups.

The chi-square tests of independence were carried out to identify whether there were statistically significant differences in terms of the demographic and participation profiles of the disabled and non-disabled groups. Pearson chi-square probability was used and it was accepted that there was a significant difference in the allocation of profiles among the disabled and the non-disabled sport participants when the p -value was equal to or less than 0.05. For variables showing statistically significant differences in the allocation of the profiles at $p \leq 0.05$, Z tests or column proportion tests were then used to determine which categories were causing the differences. The column proportions test compared pairs of column proportions on each row of a table independently, testing whether the proportion of respondents in one column was significantly different from the proportion in the other column. The significant value for multiple comparisons in the column proportion tests were adjusted using Bonferroni adjustments.

The satisfaction and importance means scores of the 19 NBS service attributes were tested for the disabled and non-disabled using the independent sample T-test. Where Levene statistics showed a p -value greater than the 0.05 significant level, this implied that the grouping by disability were having equal variance, and the standard F-statistics were used. Where Levene statistics showed a p -value equal to or less than 0.05, it meant that that particular service attribute had only 5% or less chance of having equal variances. For these attributes, the probabilities of the T-statistics with unequal variance were used. There was a significant difference in the satisfaction mean or the importance mean between the disabled and the non-disabled when the probability of t-statistics showed a p -value of equal to or less than 0.05. The same T-test was used to uncover the significant differences within the gender and ethnic groups of disabled participants.

ANOVA was performed on service attributes to uncover whether there were any statistically significant differences in the means within the disabled age groups and socio-

economic (NS-SEC¹) groupings at the 95% confidence level. A test of homogeneity of variance was carried out for each attribute to determine whether they had statistically significant different variance, in order to determine the appropriate ANOVA test for each attribute. Where Levene statistics showed a *p*-value greater than the 0.05 significance level, this implied that the groupings by individual demographic group were having equal variance, and the standard F-statistics were used. Where Levene statistics showed a *p*-value equal or less than 0.05, it meant that that particular attribute had only 5% or less chances of having equal variances. Robust tests of equality of means were carried out using the Welch test for such attributes which had unequal variances and unequal sample sizes, in place of the standard F-test. For all attributes with equal variance, the Scheffe test was used for the post hoc multiple comparison as it was the most conservative test for samples with unequal size. Meanwhile, Tamhane test was used for all other attributes because it was robust for the analysis of unequal variances.

Results

Disabled versus Non-Disabled

The chi-square test and cross-tabulations allowed comparison of the actual count with the expected count in each category (e.g., male and female) to show the likelihood of disabled and non-disabled sports participants being males or females. Where Chi-Square tests showed statistically significant differences at the 95% confidence level (i.e., $p \leq 0.05$), the cross-tabulation of the different respondent groups were studied to uncover the likelihood of them taking part in a sporting activity. For example, it was more likely for disabled females to participate in a sport activity than disabled males, as the actual number of responses by disabled females was higher than the expected responses by disabled females; and vice versa for the disabled male responses.

The Chi-Square test results show that the demographic profiles and participation patterns of the disabled were significantly different from the non-disabled at 95% confidence level ($p \leq 0.05$) for all demographic profiles and most patterns of participation. The only exception was the type of visit; the likelihood of visiting a sport centre for the first time or having visited before was not significantly related to being disabled or non-disabled.

The column proportion test (z-test) results of the demographic profiles of sport participants are portrayed in Figure 1. These results were discussed alongside the chi-square test and cross-tabulation findings. The column proportion test showed whether the proportion of disabled sport participants was significantly higher or lower than the proportion of non-disabled sport participants.

[Figure 1]

From the survey results, visits by disabled sport participants formed 9% of total visits by sports participants to the sports facilities. It was found that the majority of the sport participants were females, white, and of higher socio-economic class (NS-SEC 1&2). For the non-disabled group, people aged between 20 and 44 years old were the dominant sport participants. Whereas for the disabled groups, the dominant sport participants were those aged 45 years and above. The proportions of disabled male, Black and minority ethnic (BME), 11-44 years old and NS-SEC 1&2 (highest socio-economic class) participants were significantly lower when compared with the non-disabled group. According to the cross-tabulation results, older disabled users aged 45 years and above were more likely to participate than the younger disabled users. BMEs who were disabled were less likely to participate in sport than the white disabled. Interestingly, disabled participants who were in socio-economic classes 4 to 7 (the lowest groups), were more likely to participate in sport than the non-disabled group in the same socio-economic classes.

[Figure 2]

In general, sports participation was mainly on a casual, occasional basis, by non-first timers, and leisure card holders (Figure 2). Statistical tests showed that disabled users were more likely to participate regularly (i.e., at least three times a week) than non-disabled users, who were less likely to own leisure cards which provided them discounted admission. Z test results showed that there were statistically significant higher admissions by leisure card for the disabled group when compared with the non-disabled group. Owning a leisure card might have partly contributed to the regular participation as it allowed discounted admission, which offered more value for money of activities. An additional column proportion test showed that disabled leisure card holders had higher rates of regular sport participation than disabled non-card holders; and vice versa for occasional sport participation. Meanwhile, the disabled were more likely to participate in an organised class or instructor-led activity than the non-disabled.

[Figure 3]

Figure 3 shows that the majority of the sports participants travelled to the sport centre from home, by car or motorcycle and in short journey time (15 minutes or less). The cross-tabulation result showed that it was more likely for disabled participants to travel to the sports centres from home or other places than from their work place. This was probably because only about one-third of the disabled sport participants were working, according to the NBS survey data. The proportion of the disabled participants using public transport as the main mode of transport to the sports centres was significantly higher than the non-disabled, but significantly lower for walking all the way to the centre. Statistical test results showed that the non-disabled were more likely to travel a short journey time (0-5 minutes), whilst the disabled were more likely to travel a journey time longer than 5 minutes. The proportion of disabled travelling longer journey time (16 to 30 minutes and over 45 minutes) was significantly higher than the non-disabled.

[Figure 4]

Swimming was the most popular main activity by all participants, especially for the disabled group where the percentage for participation in swimming was even higher than the non-disabled group (Figure 4). This finding was not unexpected given that 'wet' and 'mixed' types of facilities were conspicuously successful in attracting more 60+ year olds and the disabled under 60 year olds (Liu, Taylor, & Shibli, 2009a). Apart from swimming, the disabled tended to prefer activities involving the use of fitness equipment/machines, and keep fit/aerobics. The percentage of participation in keep fit or aerobics for the disabled was significantly higher than for the non-disabled. The cross-tabulation result revealed that it was more likely for the disabled to take part in swimming or keep fit than any other physical activities, whilst the non-disabled were more likely to participate in more strenuous or more active activities (e.g., badminton, football and using fitness equipment or machine).

Pattern of participation by demographic profiles.

The column proportion tests were performed on the demographic profiles of disabled and non-disabled groups to uncover the relationship between the patterns of participation and the different demographics of these groups.

[Table 2]

The example in Table 2 shows that the proportion of the disabled participating in sports occasionally was statistically higher for the 11-19 year olds than any other age groups, whilst the proportion of 60+ year olds was also higher than the proportion of 45-49 year olds. For occasional participation, there were no statistically significant differences between the proportions of the 20-34 year olds, the 35-44 year olds and the 45-59 years olds. In contrast, for regular sport participation, the proportion of young disabled aged 11-19 years was significantly lower than all other age groups, whilst the proportion of 45-59 years was higher than that of the 60+ years.

[Table 3]

The results of the column proportion tests are summarised in Table 3 for demographic profiles and frequency of visits. For both disabled and the non-disabled, females, whites, 11-19 year olds and NS-SEC 3 had significantly higher participation rates in occasional sport participations but significantly lower participation rates in regular sport participation than their other counterparts.

Popular sport activities by demographic profiles.

The three most popular activities among the disabled, namely swimming, fitness equipment and keep fit, were tested against the demographic profiles using column proportion test. For the disabled, the socio-economic classes showed no statistically significant influence on the proportions taking part in these sporting activities. Some similar demographic profiles were found for the disabled and the non-disabled in terms of gender, ethnicity and to a certain extent for age for these chosen activities (Table 4).

[Table 4]

Table 4 shows that swimming was most popular among the females and the whites for the disabled and the non-disabled. Older participants also tended to have higher proportions in swimming, especially for participants aged 60 years and over. For the use of fitness equipment, this was dominated by males and BMEs. The middle age disabled, aged 20 to 59 years old, had significantly higher participation in terms of the use of fitness equipment than other age groups. In general, older sports participants (aged 60 years or over) had the lowest participation rates in terms of fitness equipment. Females and BMEs had significantly higher proportions than males and whites respectively in keep fit or aerobics. Meanwhile, the youngest age group (11-19 year olds) had the lowest proportions for keep fit or aerobics.

Satisfaction and Importance of Service Attributes

The independent sample t-test results showed that the average satisfaction scores among the disabled were significantly higher than the non-disabled for 17 of the 20 NBS

service attributes, including their overall visit experience (Table 5). The average importance attached to individual service attributes was statistically different for the disabled and the non-disabled for 16 of the 19 attributes, with majority of the attributes having higher importance for the disabled (Table 5). The only exception was the range of activities available. This was not surprising as the disabled prefer to participate in certain sport activities.

[Table 5]

Satisfaction and importance of service attributes by demographics of disabled.

The satisfaction and importance levels of service attributes were then examined in more detail for the disabled group to uncover whether there was any significant difference within their demographic profiles. This may facilitate management decision in attracting more disabled participations whilst preventing the drop out by these participants with reference to the industry strengths and weaknesses (NB later section on satisfaction and importance grid analysis). The gender and ethnic groups were examined using the independent sample T-test whilst the age groups and socio-economic groups were examined using ANOVA and tests of equality of means at 95% confidence level.

[Table 6]

Table 6 shows that disabled male participants had significantly different satisfaction level for 8 of the 20 service attributes, of which 6 were higher for males than females. However, the differences between their satisfaction levels were mostly small. Bigger differences were found for the water temperature in the pool and the two cleanliness attributes, which might partly be attributed to females being more likely to use the wet facilities and cleanliness was an industry problem at such facilities. Importance levels of service attributes were significantly lower for the disabled males in comparison with the disabled females for 16 of the service attributes. Meanwhile, satisfaction levels for the white

ethnic group were significantly higher than the Black and minority ethnic group for 18 of the service attributes. White ethnics also had significantly higher importance for 11 attributes, but lower importance for three other attributes (Table 6).

[Table 7]

The satisfaction levels of the disabled were significantly different for 18 and 15 service attributes respectively in terms of age groups and socio-economic groups at the 95 per cent confidence level (Table 7). The most prominent results of the age group comparisons were older participants (particularly 60+ years) had significantly higher satisfaction than other younger age groups generally. Disabled aged 20 to 44 years tended to have significantly lower satisfaction levels. Table 7 also reveals that satisfaction levels of the lower socio-economic groups (particularly NS-SEC 6&7) were significantly higher than that of the higher socio-economic groups (i.e., NS-SEC 1 to 3) generally. NS-SEC 6&7 had significantly higher satisfaction than the NS-SEC 1&2 for 15 service attributes.

[Table 8]

Table 8 shows that older disabled participants aged 35 and above were generally attaching higher importance to service attributes than the younger participants aged 11 to 34 years old. The exceptions were the range of activities and quality of food and drink, where some younger age groups had higher importance levels. Meanwhile, the different socio-economic groups had significantly different importance levels for 13 service attributes at the 95 per cent confidence level (Table 8). The lowest socio economic group (NS-SEC 6&7) and the upper middle socio economic group (NS-SEC 3) placed higher importance than the highest group (NS-SEC 1&2) for 7 service attributes which related to cleanliness, staff, activity charges and value for money of activities.

Overall, the T-test and ANOVA results revealed that the types of disabled participants that were most difficult to please or attract were likely to be females, 35-44 year olds and NS-

SEC 3 because these groups tended to have significantly higher importance and lower satisfaction for service attributes. Second to these groups will be the BME, aged 20-34 years old and NS-SEC 1&2 as they mostly had lower satisfaction but lower importance for service attributes too. In contrast, disabled males and NS-SEC 5 were the easiest to please and attract due to their lower importance and higher satisfaction levels of attributes generally. Older participants aged 45 and above, whites and NS-SEC 6&7 were also relatively easier to please since these groups tended to have higher satisfaction levels despite that they also had higher importance levels. There were no strong distinguishing patterns of satisfaction for the 11-19 year olds and NS-SEC 4, although both groups (especially 11-19 year olds) seemed to have lower importance for service attributes.

Satisfaction and importance grid analysis.

It was relevant to look at the industry strengths and weaknesses which might affect the sporting experience of the disabled participants at public sport centres. The grid analysis for the disabled positioned each service attribute in one of four quadrants, which were separated by lines at the average importance and satisfaction scores for the 19 service attributes (across all disabled users). Each quadrant has different implications for interpretation and action. For example, in Figure 5 'food and drink' appears to have the lowest satisfaction score (quadrant III), but it was not high in importance and hence it was not an area of primary concern. Meanwhile, cleanliness of the changing areas and the activity spaces, as well as the water temperature in the pool appeared to be the main areas of concern (in quadrant IV) and hence there would be an urgent need to increase satisfaction in line with the high importance that disabled sport participants attached to them. The appearance of cleanliness attributes in the high importance and low satisfaction quadrant of the grid analysis was not surprising as it was a common problem in the industry, according to overall NBS data (Liu, Taylor, & Shibli, 2009b).

Cleanliness is clearly the industry barometer because it was the area which was consistently the most important to customers. At the same time it was also the area where customer satisfaction levels tended to be low (i.e., there was a high Importance-Satisfaction gap), particularly where swimming pools were involved (Kung, Ramchandani, & Taylor, 2011, p. 88).

[Figure 5]

There were several attributes which had the highest satisfaction and importance means (i.e., in Quadrant I) among the disabled - the staff attributes, availability of activities and value for money of activities (Figure 5). These were the industry strengths.

The grid analysis of satisfaction of importance levels of service attributes for the non-disabled showed similar patterns as that of the disabled participants. The same attributes appeared in the four same quadrants. These findings signify that the industry weaknesses and strengths were the same for the disabled and the non-disabled although levels of satisfaction and importance for majority of the attributes were significantly different for these groups of participants.

Conclusion and Implication

This paper confirms that the disabled sports participants in public sports centres are different to non-disabled participants in terms of almost all of the demographic aspects examined and the patterns of participation. Hence, to increase sports participation by the disabled and improve their experiences at public sports centres, it is necessary to implement management strategies specifically targeting at the disabled group or subgroups, which help overcoming the extra barriers faced by the disabled rather than blanket strategies for all. Hence Sport England is working with the disability sector to identify specific barriers to disabled participation and strategies to best target its additional £8 million investment to ensure the best results for sport for disabled people (Sport England, 2010b).

The findings that the disabled were more likely than the non-disabled to participate in organised activities led by an instructor, and having high importance attached to staff attributes, support Liu's (2009) recommendation for a greater focus on providing competent support at sport centres, i.e., trained sports centre staff to enable people with a disability to have the confidence to take part in sport or to try new sports. Moreover, participation rates by the disabled in any one sport other than the three most popular activities mentioned are generally below 5%. An exclusive discount for instructor-led activities may also encourage disabled participation.

Sport participation by disabled 11-19 year olds and lower socio-economic groups were relatively low compared to their counterparts. This is not surprising given that socioeconomic status and financial constraints among the young disabled people were two of the many barriers to participation by the disabled as identified in other researchers' studies. Meanwhile, disabled sport participants with leisure cards had significantly higher regular participation rates and lower occasional participation rates than the disabled non-card holders. Hence, it may be worth considering pricing and promotion through use of discount schemes and leisure cards for the disabled. This may increase the frequency of visits by the existing disabled participants and appeal to disabled non-participants.

The journey made by the disabled to sports centres was normally longer than 5 minutes. The majority of them travelled to sports centre from home and by car. However, they were more likely than the non-disabled to travel to sport centres by public transport. It may be necessary to provide free transportation to sports centres where there are high proportions of disabled in the centre's catchment area population, as it is likely that mobility or transport problems are obstacles to their participation.

Among the disabled, females, whites, older participants aged 45 years old and above, and socioeconomic groups 1& 2 were the dominant participants at public sports centres by

gender, ethnicity, age and socioeconomics. Although some disabled groups were harder to please or attract, measures should be taken to try increasing participation by less represented disability groups (i.e., males, BMEs and younger participants aged less than 45 years old).

It is essential that the industry weaknesses (i.e., relatively important to disabled participants but with which they were relatively dissatisfied) as identified by the grid analysis, are addressed carefully in order to prevent drop out by the dominant disability groups, and to increase participation by the minorities; whilst maintaining the strengths of the industry. These industry strengths and weaknesses as identified by the grid analyses for the disabled were similar to that of the non-disabled. Hence addressing those weaknesses will benefit all participants. Various sports facility studies have emphasised the importance of physical evidence in improving the quality of sports facilities' services (e.g., Liu et al., 2008; Lentell, 2000). This is particularly relevant to the industry weaknesses (cleanliness and water temperature in the pool) identified for the disabled in this paper. The five most important NBS service attributes for the disabled at public sport centres were water quality in pool, cleanliness of changing area, cleanliness of activity spaces, availability of activities at convenient times and standard of coaching/instruction – of which three are physical evidence.

There were several limitations in this study. First, although accessibility to sports activities was explored in terms of several service attributes (availability of activities at convenient times, ease of booking, activity charges and range of activities available), physical access to specific parts of facilities was not measured in the NBS data. Second, there was insufficient information to distinguish whether centres have facilities or programmes specially catering for disabled users - this may have affected the disabled's sport participation or level of satisfaction, as well as the main sport activities undertaken by the disabled. Third, NBS data also did not identify the types of disabilities which could have affected the disabled's sport participation. Fourth, NBS data did not identify the exclusive disabled sport

activities and only normal sport activities were available - however, the latter allows comparison with the non-disabled's participation. It may be worth considering the first two limitations by investigating the NBS centres which had the highest disabled participation rates and higher levels of customer satisfaction, or exploring centres with Inclusive Fitness Initiative (IFI²) Mark Accreditation in future studies.

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Footnotes

1. The National Statistics Socio-economic Classification (NS-SEC) is the primary social classification in the United Kingdom. Information on NS-SEC and the eight socio-economic classes used in the NBS analysis is available from <http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/soc2010/soc2010-volume-3-ns-sec--rebased-on-soc2010--user-manual/index.html>
2. The IFI Mark is the leading fitness accreditation for recognising leisure facilities commitment and inclusion of disabled people within their service provision.

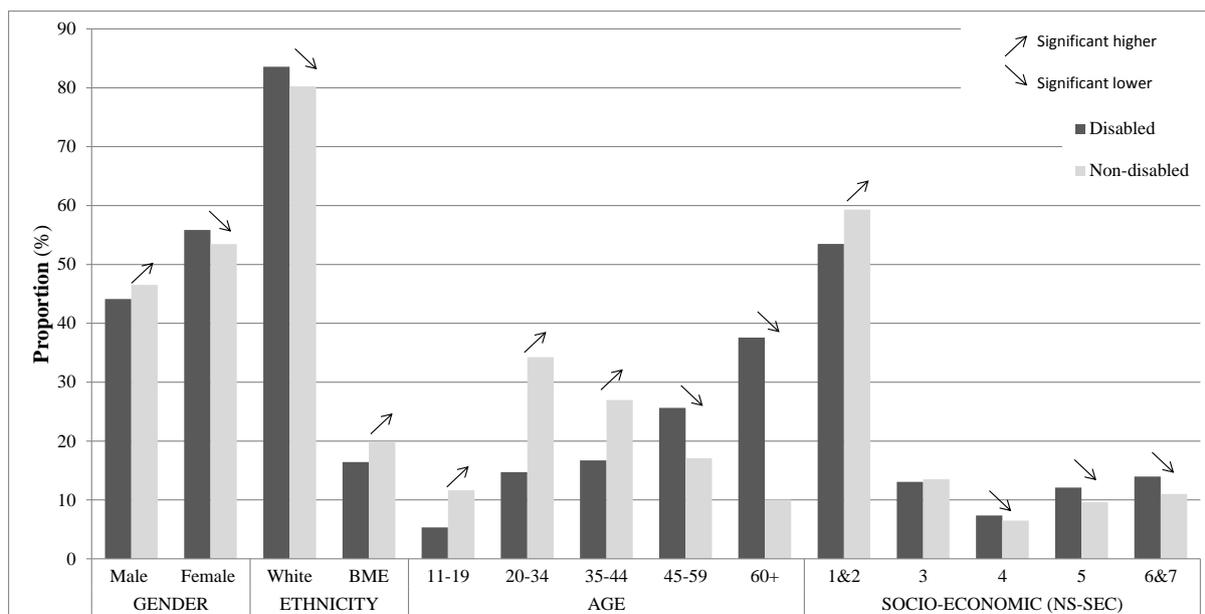


Figure 1. Demographic profiles of sport participants and Z-test results ($p \leq 0.05$), as in Appendix A.

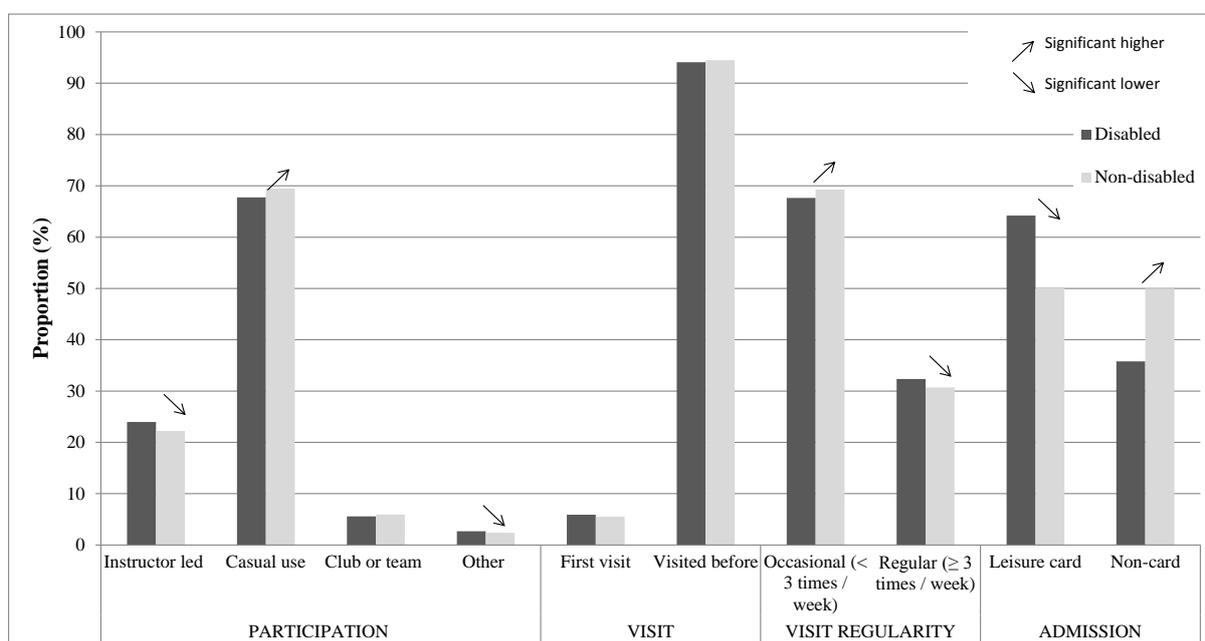


Figure 2. Patterns of participation by sport participants and Z-test results ($p \leq 0.05$), as in Appendix A.

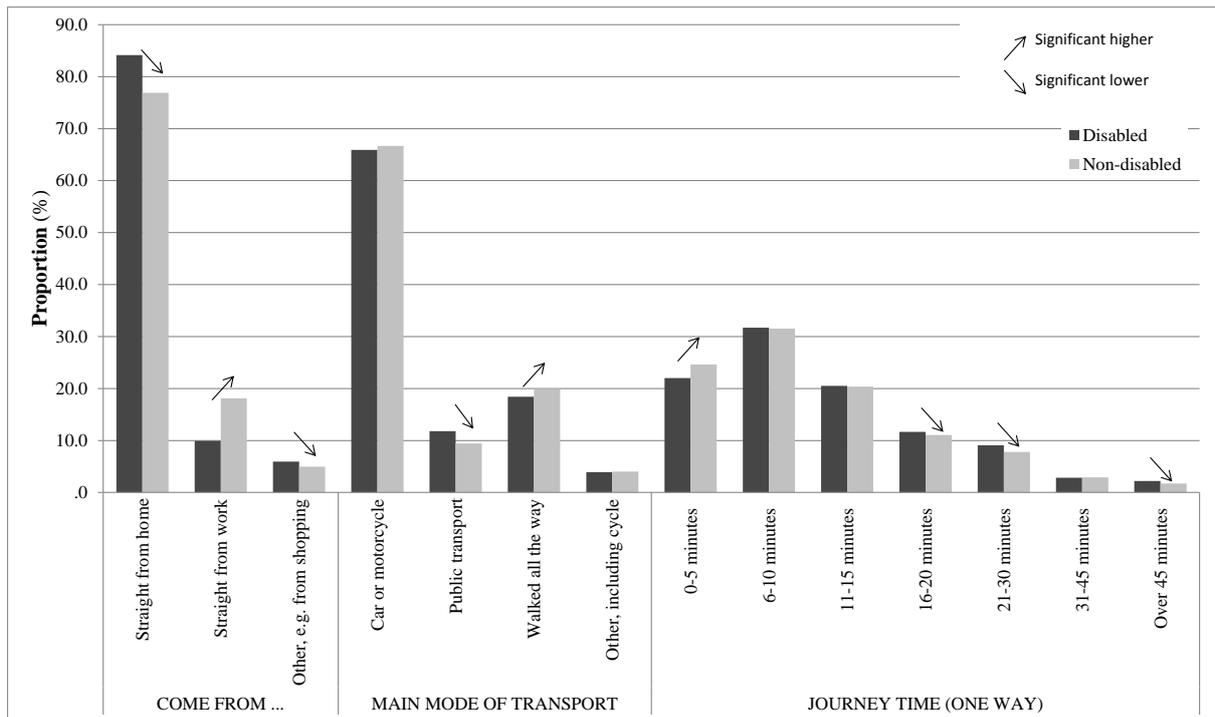


Figure 3. Travel by sport participants and Z-test results ($p \leq 0.05$), as in Appendix A.

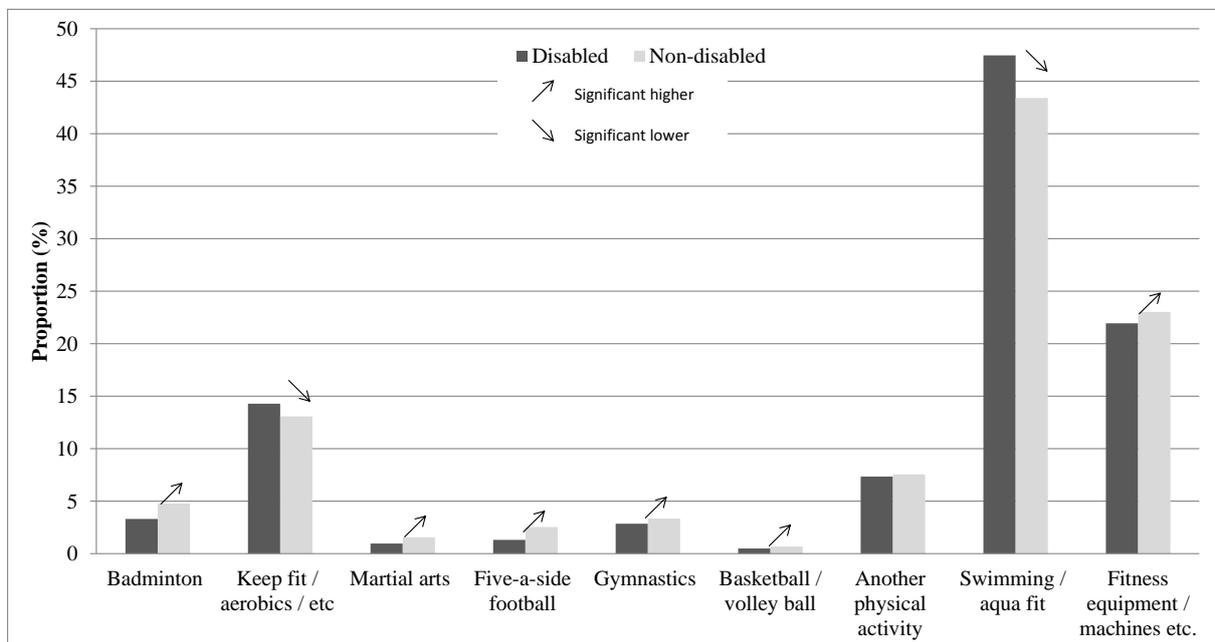


Figure 4. Most stated main sport activities at NBS sports centres and Z-test results ($p \leq 0.05$), as in Appendix A.

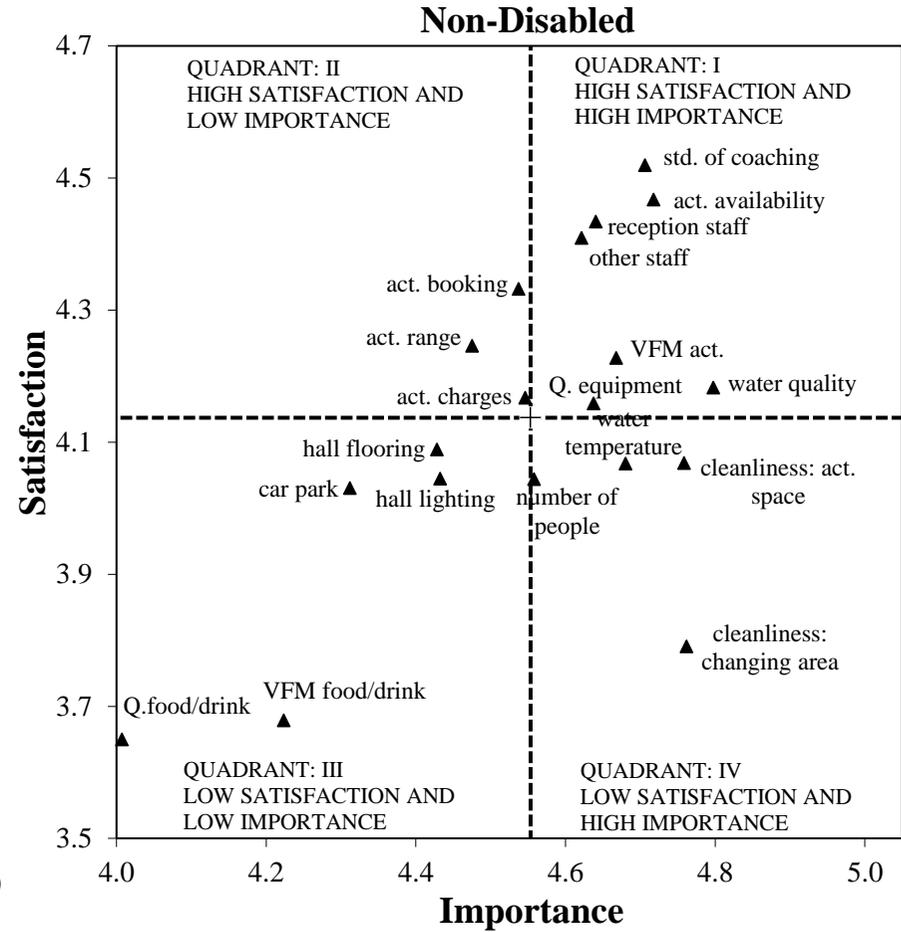
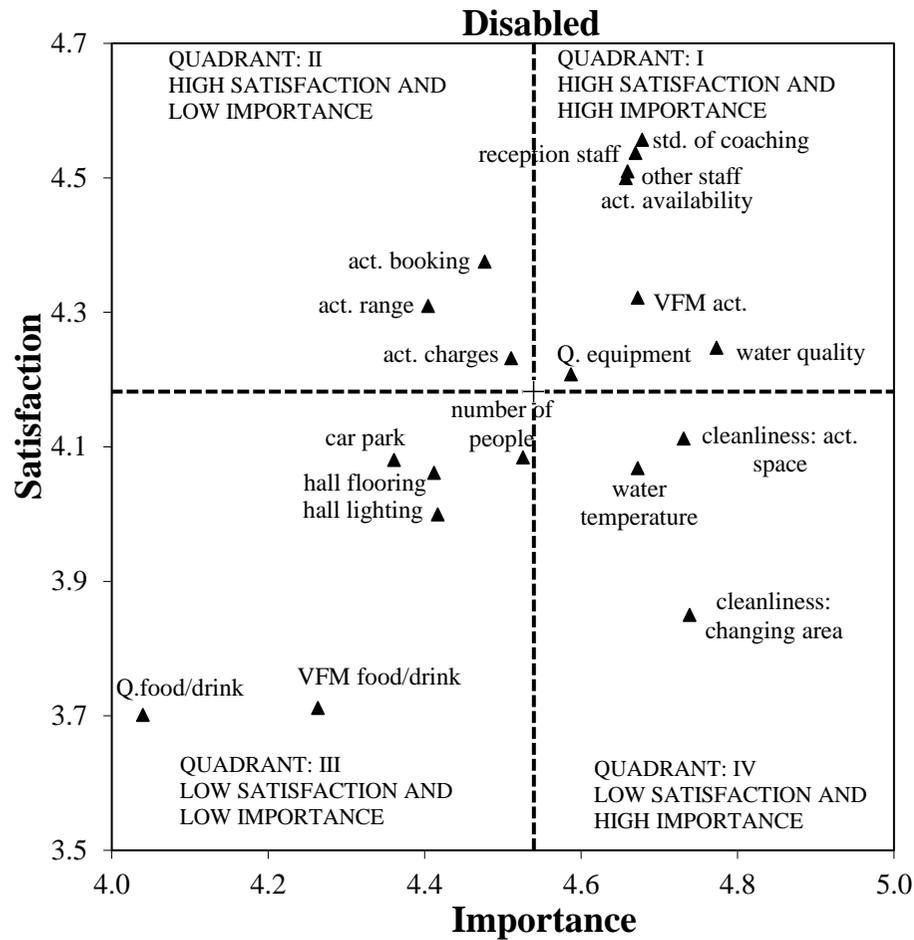


Figure 5. Grid analysis of importance and satisfaction means of service attributes.

Table 1

Comparison of NBS Service Attributes with Other Frameworks or Models

NBS dimensions/ attributes	CERM CSQ (Howat <i>et al.</i>, 1996)	3Ps (Booms and Bitner, 1981)	Grönroos (1984)
Accessibility	core service	process	functional
Availability of activities at convenient times	core service	process	functional
Ease of booking	core service	process	functional
Activity charges/fees	core service	process	functional
Range of activities available	core service general facility; core and secondary services	process	functional
Quality of facility	physical evidence	technical	
Quality of flooring in sports hall	core service	physical evidence	technical
Quality of lighting in sports hall	core service	physical evidence	technical
Quality of equipment	core service	physical evidence	technical
Water quality in pool	core service	physical evidence	technical
Water temperature in pool	core service	physical evidence	technical
Number of people in pool	core service	physical evidence	technical
Quality of car parking on site	general facility	physical evidence	technical
Quality of food/drink	secondary service	physical evidence	technical
Cleanliness	general facility	physical evidence	technical
Cleanliness of changing area	general facility	physical evidence	technical
Cleanliness of activity spaces	general facility	physical evidence	technical
Staff	staff quality	participant	functional
Helpfulness of reception staff	staff quality	participant	functional
Helpfulness of other staff	staff quality	participant	functional
Standard of coaching/instruction	staff quality core and secondary services	participant	functional
Value for money	physical evidence	technical	
Value for money of activities	core service	physical evidence	technical
Value for money of food/drink	secondary service	physical evidence	technical

Table 2

Comparison of Column Proportions for Disabled Age Groups by Visit Frequency ($p \leq 0.05$)

Visit Frequency \ Age Group	11-19 (A)	20-34 (B)	35-44 (C)	45-59 (D)	60+ (E)
Occasional (< 3 times/week)	Column % 76.1%	67.7%	68.2%	64.5%	68.2%
Comparisons	B C D E				D
Regular (≥ 3 times/week)	Column N % 23.9%	32.3%	31.8%	35.5%	31.8%
Comparisons		A	A	A E	A

Note. For each significant pair, the key of the category with the smaller column proportion appears under the category with the larger column proportion.

Table 3

Column Proportion Test Results of Demographics by Visit Frequency (VF) ($p \leq 0.05$)

VF \ Profile	Disabled	Non-Disabled
Occasional		
Gender	Female > Male	Female > Male
Ethnicity	White > BME	White > BME
Age	11-19 > all other groups; 60+ > 45-59	11-19 > 35-44 > all other groups; 60+ > 20-34
Socio-economic	NS-SEC 3 > all other groups	NS-SEC 3 > NS-SEC 1&2 > NS-SEC4 and NS-SEC 6&7 > NS-SEC 5
Regular		
Gender	Male > Female	Male > Female
Ethnicity	BME > White	BME > White
Age	45-59 > 60+; all other groups > 11-19	All other groups > 35-44 > 11-19; 20-34 > 60+
Socio-economic	All other groups > NS-SEC 3	NS-SEC5 > NS-SEC 4 and NS-SEC 6&7 > NS-SEC 1 & 2 > NS-SEC3

Table 4

Column Proportion Test Results of Demographics by Main Sport Activities ($p \leq 0.05$)

Sports\ Profiles	Disabled	Non-Disabled
Swimming		
Gender	Female > Male	Female > Male
Ethnicity	White > BME	White > BME
Age	60+ > all other groups; 35-44 and 45-59 > 20-34	60+ > 35-44 > 45-59 > 11-19 and 20-34
Socio-economic	Indifferent	All other groups > NS-SEC 5; NS-SEC 1&2 and NS-SEC3 > NS-SEC 6&7
Fitness equipment		
Gender	Male > Female	Male > Female
Ethnicity	BME > White	BME > White
Age	20-34, 35-44 and 45-59 > 11-19 and 60+	20-34 > 11-19 > 45-59 > 35-44 > 60+
Socio-economic	Indifferent	NS-SEC5 and NS-SEC 6 & 7 > NS-SEC 4 > NS-SEC1&2 and NS-SEC 3
Keep fit		
Gender	Female > Male	Female > Male
Ethnicity	BME > White	BME > White
Age	All other groups > 11-19	20-34 > all other groups > 11-19; 45-59 > 35-44
Socio-economic	Indifferent	NS-SEC3 > NS-SEC1&2 > all other groups

Table 5

T-test of Equality of Means for Satisfaction and Importance of Service Attributes

	Satisfaction Means			Importance Means				
	<i>t</i>		Disabled	Non-disabled	<i>t</i>	Disabled	Non-disabled	
Availability of activities at convenient times	4.96	**	4.50	4.47	-1.93	4.66	4.67	
Ease of booking	4.63	**	4.38	4.33	-1.39	4.48	4.49	
Activity charges/fees	7.73	**	4.23	4.17	2.27	*	4.51	4.50
Range of activities available	8.19	**	4.31	4.25	-2.80	*	4.40	4.43
Quality of flooring in sports hall	-1.03		4.06	4.09	2.93	*	4.41	4.38
Quality of lighting in sports hall	-1.53		4.00	4.04	3.02	*	4.42	4.38
Quality of equipment	4.82	**	4.21	4.16	-0.11		4.59	4.59
Water quality in pool	6.29	**	4.25	4.18	3.76	**	4.77	4.75
Water temperature in pool	0.02		4.07	4.07	5.38	**	4.67	4.63
Number of people in pool	3.73	**	4.08	4.04	2.04	*	4.53	4.51
Quality of car parking on site	3.90	**	4.08	4.03	12.09	**	4.36	4.26
Quality of food/drink	3.58	**	3.70	3.65	7.15	**	4.04	3.96
Cleanliness of changing area	5.44	**	3.85	3.79	5.13	**	4.74	4.71
Cleanliness of activity spaces	4.79	**	4.11	4.07	4.31	**	4.73	4.71
Helpfulness of reception staff	16.04	**	4.54	4.43	15.25	**	4.67	4.59
Helpfulness of other staff	15.15	**	4.51	4.41	16.59		4.66	4.57
Standard of coaching/instruction	3.41	**	4.56	4.52	3.28	*	4.68	4.66
Value for money of activities	12.43	**	4.32	4.23	10.33	**	4.67	4.62
Value for money of food/drink	2.38	*	3.71	3.68	8.82	**	4.26	4.17
Overall satisfaction of visit	11.38	**	4.40	4.33				

Notes. * $p \leq 0.05$. ** $p \leq 0.001$

Table 6

T-test Results for Satisfaction and Importance Means of NBS Service Attributes by Disabled Demographics

	Satisfaction Mean Difference		Importance Mean Difference	
	Male-Female	White-BME	Male-Female	White-BME
Availability of activities	0.02	0.18 **	-0.08 **	0.08 **
Ease of booking	0.01	0.22 **	-0.11 **	0.03
Activity charges/fees	-0.04 *	0.22 **	-0.14 **	0.03
Range of activities available	0.02	0.26 **	-0.10 **	-0.07 **
Quality of flooring in hall	0.08	0.06	0.00	-0.03
Quality of lighting in hall	-0.04	0.03	0.02	-0.01
Quality of equipment	0.06 *	0.18 **	-0.01	0.10 **
Water quality in pool	0.05 *	0.29 **	-0.06 **	0.14 **
Water temperature in pool	0.19 **	0.24 **	-0.10 **	0.10 **
Number of people in pool	0.00	0.23 **	-0.11 **	0.12 **
Quality of car parking	0.06 *	0.13 *	-0.08 **	0.00
Quality of food/drink	0.03	0.11 *	-0.06 *	-0.15 **
Cleanliness of changing area	0.28 **	0.19 **	-0.08 **	0.12 **
Cleanliness of activity spaces	0.17 **	0.26 **	-0.08 **	0.13 **
Helpfulness of reception staff	0.02	0.28 **	-0.09 **	0.07 **
Helpfulness of other staff	0.02	0.26 **	-0.09 **	0.08 **
Standard of coaching/instruction	-0.03	0.34 **	-0.13 **	0.13 **
Value for money of activities	-0.03 *	0.28 **	-0.11 **	0.04 *
Value for money of food/drink	0.01	0.11 *	-0.07 *	-0.09 **
Overall satisfaction of visit	0.01	0.32 **		

Notes. * $p \leq 0.05$. ** $p \leq 0.001$

Table 7

ANOVA Results for Satisfaction with NBS Service Attributes by Disabled Demographics

Tamhane / Scheffe Post Hoc Comparison of Satisfaction Means		
	Age groups	Socio Economic Group (NS-SEC)
Availability of activities	** 60+> all other groups; 45-59 >35-44 and 20-34	
Ease of booking	** 60+> all other groups; 45-59 > 20-34	
Activity charges/fees	** 60+> all other groups; 45-59 >35-44 and 20-34	** 6&7 > 1&2, 4 and 5
Range of activities available	** 60+> 45-59 & 11-19 >35-44 and 20-34	** 6&7 > 1&2 and 3
Quality of flooring in hall		** 6&7 > 1&2 and 3; 5 > 1&2
Quality of lighting in hall		** 6&7 and 5 > 1&2
Quality of equipment	** 60+ & 11-19 > all other groups	** 6&7 and 5 > 1&2
Water quality in pool	** 60+> all other groups; 45-59 >35-44 and 20-34	** 6&7 > 1&2
Water temperature in pool	** 60+> all other groups; 45-59 >35-44	
Number of people in pool	** 60+> all other groups; 45-59 >35-44 and 20-34	* 6&7 > 1&2
Quality of car parking	** 60+> 45-59 > 35-44; 60+> 20-34	
Quality of food/drink	** 60+ and 11-19 > all other groups	** 6&7 and 5 > 1&2
Cleanliness of changing area	** 60+ and 11-19 > 45-59 and 20-34 > 35-44	** 6&7, 5 and 4 > 1&2 and 3
Cleanliness of activity spaces	** 60+ and 11-19 > all other groups	** 6&7 and 5 > 1&2 and 3; 4 > 1&2
Helpfulness of reception staff	** 60+> all other groups; 45-59 >35-44 and 20-34	** 6&7 > 1&2 and 3; 5 > 1&2
Helpfulness of other staff	** 60+> all other groups; 45-59 >35-44 and 20-34	** 6&7 > 1&2 and 3; 5 > 1&2
Standard of coaching/instruction	** 60+> all other groups; 45-59 >35-44 and 20-34	
Value for money of activities	** 60+> all other groups; 45-59 >35-44 and 20-34	** 6&7 > 1&2
Value for money of food/drink	** 60+> 45-59, 35-44 and 20-34; 11-19 > 35-44	** 6&7 and 5 > 1&2
Overall satisfaction of visit	** 60+> all other groups; 45-59 >35-44 and 20-34; 11-19 > 20-34	** 6&7 and 5 > 1&2

Notes. * $p \leq 0.05$. ** $p \leq 0.001$

Table 8

ANOVA Results for Importance of Service Attributes by Disabled Demographics

Tamhane / Scheffe Post Hoc Comparison of Importance Means		
	Age groups	Socio Economic Group (NS-SEC)
Availability of activities	** 45-59 > 60+ and 35-44 > 20-34 and 11-19	** 6&7, 3 and 1&2 > 5
Ease of booking	** 60+, 45-59 and 35-44 > 20-34 and 11-19	* 1&2 > 5
Activity charges/fees	** 60+, 45-59 and 35-44 > 20-34 and 11-19	** 6&7 > 5, 4 and 1&2; 3 > 1&2 and 4
Range of activities available	** 35-44 > 20-34 & 60+; 45-59 > 60+	
Quality of flooring in hall	** 60+, 45-59 and 35-44 > 20-34 ; 60+ > 11-19	
Quality of lighting in hall	** 60+, 45-59, 35-44 and 11-19 > 20-34	
Quality of equipment	** 60+, 45-59 and 35-44 > 20-34 ; 35-44 > 11-19	
Water quality in pool	** 60+ and 45-59 > 35-44, 20-34 and 11-19	
Water temperature in pool	** 60+ > all other groups; 45-59 > 35-44 and 20-34	* 6&7 > 1&2
Number of people in pool	** 60+ and 45-59 > 35-44, 20-34 and 11-19; 35-44 > 11-19	
Quality of car parking	** 60+ > 45-59 > 35-44, 20-34 and 11-19	**
Quality of food/drink	** 60+ and 11-19 > all other groups	** 6&7 and 5 > 1&2
Cleanliness of changing area	** 60+ and 45-59 > 35-44 > 20-34 and 11-19	** 6&7 and 3 > 1&2
Cleanliness of activity spaces	** 60+ > 45-59 > 35-44 > 20-34 and 11-19	** 6&7 and 3 > 1&2
Helpfulness of reception staff	** 60+ > 45-59 > 35-44 > 20-34 and 11-19	** 6&7 and 3 > 5, 4 and 1&2
Helpfulness of other staff	** 60+ > 45-59 > 35-44 > 20-34 and 11-19	** 6&7 and 3 > 5 and 1&2; 6&7 > 4
Standard of coaching/instruction	** 60+ > 35-44, 20-34 and 11-19; 45-59 and 35-44 > 20-34 and 11-19	** 6&7 and 3 > 5 and 1&2; 3 > 4
Value for money of activities	** 60+ > all other groups; 45-59 and 35-44 > 20-34 and 11-19	** 6&7 and 3 > 5, 4 and 1&2
Value for money of food/drink	** 60+ > 45-59, 35-44 and 20-34	** 5 > 1&2

Notes. * $p \leq 0.05$. ** $p \leq 0.001$

Appendix A: Z-test results of demographic profiles and sport participation

	Disabled	Non-disabled	Z		Disabled	Non-disabled	Z
Gender	N = 13,430	135,236		Type of Participation	N = 13,346	134,476	
Male	44%	47%	5.34	Instructor led	24%	22%	-4.66
Female	56%	53%	-5.34	Casual use	68%	69%	4.09
Ethnicity	N = 13,331	134,288		Club or team	6%	6%	1.62
White	84%	80%	-9.29	Other	3%	2%	-2.13
BME	16%	20%	9.29	Type of Visit	N = 13,527	135,952	
Age Group	N = 13,336	134,420		First visits	6%	5%	-1.95
11-19	5%	12%	22.10	Visited before	94%	95%	1.95
20-34	15%	34%	45.94	Visit Regularity	N = 12,050	121,658	
35-44	17%	27%	25.76	Occasional (< 3 times/week)	68%	69%	3.72
45-59	26%	17%	-24.55	Regular (≥3 times per week)	32%	31%	-3.72
60+	38%	10%	-91.69	Type of Admission	N = 13,471	135,457	
Socio-Economic (NS-SEC)	N = 10,576	105,911		Leisure card	64%	50%	-31.42
1 & 2	53%	59%	11.60	Non-card	36%	50%	31.42
3	13%	14%	1.28	Come from ...	N = 13,439	135,412	
4	7%	6%	-3.41	Straight from home	84%	77%	-19.19
5	12%	10%	-8.09	Straight from work	10%	18%	23.98
6 & 7	14%	11%	-9.13	Other, e.g. from shopping	6%	5%	-4.94
Main Activity	N = 13,574	136,474		Main mode of transport	N = 13,411	134,897	
Badminton	3.3%	4.8%	7.73	Car or motorcycle	66%	67%	1.85
Keep fit / aerobics / etc	14.3%	13.1%	-3.97	Public transport	12%	9%	-8.87
Martial arts	1.0%	1.6%	5.43	Walked all the way	18%	20%	4.11
Five-a-side football	1.3%	2.5%	8.89	Other, including cycle	4%	4%	0.57
Gymnastics	2.9%	3.3%	3.08	Journey time (one way)	N = 13,412	134,972	
Basketball / volley ball	0.5%	0.7%	2.62	0-5 minutes	22%	25%	6.70
Another physical activity	7.3%	7.6%	0.89	6-10 minutes	32%	32%	-0.37
Swimming / aqua fit	47.5%	43.4%	-9.09	11-15 minutes	21%	20%	-0.44
Fitness equipment / machines	21.9%	23.0%	2.85	16-20 minutes	12%	11%	-2.08
				21-30 minutes	9%	8%	-5.36
				31-45 minutes	3%	3%	0.51
				Over 45 minutes	2%	2%	-3.92