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Involvement in the Special Olympics

Psychosocial impact of involvement in the Special Olympics

Abstract

Existing evidence suggests that people with intellectual disabilities are vulnerable to low self-esteem leading to additional psychosocial issues such as social exclusion and stress. Previous research into the involvement of Special Olympics (SO) of people with intellectual disabilities has indicated positive psychosocial outcomes. Involvement in sport is known generally to have psychological and social benefits. This study aimed to compare the psychosocial impact of involvement in sport through the SO to no or limited sports involvement, for a sample of people with intellectual disabilities. A cross sectional design was employed comparing three groups, SO, Mencap Sports, and Mencap No Sports on the variables: Self-esteem, quality of life, stress levels and social networks. One hundred and one participants were recruited either through the SO or Mencap. Data were collected through the completion of validated questionnaires by one to one interviews with the participants. Analysis revealed that self-esteem, quality of life, and stress were all significantly associated with SO involvement. Logistic regression analysis was used to explore whether scores on these variables were able to predict group membership. Self-esteem was found to be a significant predictor of group membership, those in the SO having the highest self-esteem. The findings provide further evidence of a positive association between sport involvement and increased psychological wellbeing, especially for those involved in the SO. The

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implications of these findings for practice and future research into the relationship between sport and psychological wellbeing within the learning disabled population are considered.

Keywords: Special Olympics; sport; psychological impact; social impact

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1. Introduction

Health outcomes for people with intellectual disabilities have been shown to be inferior to those of the mainstream population (Anderson et al, 2013; Emerson, et al, 2009; Evenhuis, Henderson, Beange, Lennox, & Chicoine, 2000). In addition to poorer physical health, people with intellectual disabilities are estimated to experience significantly more mental health problems (30-50%) than the general population (Smiley, 2005). In a large scale audit of the mental health of young people with intellectual disabilities in the UK, Emerson & Hatton (2008) found that the high levels of mental health problems in this population were ‘not a consequence of their learning disability, but simply because of their increased chances of being exposed to poverty, social exclusion and more challenging family environments’ (p.7). Similar findings have been replicated in other countries across the world, e.g. Australia (Howlett, Florio, Xu, & Trollor, 2014); Brazil (Surjus & Campos, 2014) and the US (Scott & Havercamp, 2014).

The pathway to a reduced quality of life has been well documented, with social isolation resulting from poor social support networks being clearly implicated (Lippold & Burns, 2009). Intra-personal resources have also been shown to mediate between vulnerability and resilience in facing challenging life circumstances, with low self-esteem being highly prevalent in this population (Paterson, McKenzie & Lindsay, 2012). Such contextual and intra-personal circumstances contribute to potential heightened levels of stress and an iterative process resulting in a self-maintaining system of reduced quality of life.

It is recognised within the wider population that engaging in sport and exercise is an effective intervention to address poor psychological well-being. Studies have shown that engaging in sport significantly lowers levels of depression, anxiety, stress, panic disorder, negative affect, distrust and anger (e.g. Hassmen, Koivula & Uutela, 2000; Paluska & Schwenk, 2000; Gilman, 2001). Not only has involvement in sport been shown to ameliorate

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existing psychological problems, but it has also been shown to strengthen resilience factors (Alvord & Grados, 2005). For example, increased self-esteem has been found to be positively correlated with physical activity and sports involvement (Fox, 1999; McGee, Williams, Howden-Chapman, Martin & Kawachi, 2006). Such findings are especially important when considering how to support disenfranchised and potentially vulnerable groups.

Within the context of the general population, sport involvement leads to engaging with wider networks (team mates, competitors, coaches, family, peers, and officials) which form a multifaceted and complex social network, adding to the general psychological well-being of the participants (Babkes & Weiss, 1999; Brustad & Partridge, 2002; Côté, 1999; Weiss & Smith, 2002). Such involvement has not only individual benefits but potentially societal ones. For example, Bailey (2005) found in a sample of young people that involvement in physical education programmes had a powerful effect not just on upon their self-esteem and confidence, but also on acceptance by their peers.

People with intellectual disabilities are clearly a population who may benefit from participation in sports and exercise, yet studies from across the globe have demonstrated that participation in sport and exercise for this population is consistently lower than the average population (e.g. Marquis & Baker, 2015; Barnes, Howie, Mcdermott & Mann, 2013; King, Shields, Imms, Black, Ardern, 2013; Sports England, 2010). Sport and exercise interventions to date have been largely targeted at weight management and the use of this type of intervention to address wider psychological issues as yet remains a neglected area (Bartlo & Klein, 2011). Despite this recent reviews of the limited existing literature suggest good potential for such interventions. Four key papers have reviewed the studies researching sports and exercise within the learning disabled population: Lancioni and O'Reilly, 1998; Johnson, 2009; Hutzler and Korsensky, 2010; and Bartlo and Klein, 2011. These reviews described similar benefits to the general population, including: (1) improved physical factors

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e.g. aerobic capacity; gross motor function; physical fitness and endurance; skill levels; balance and muscle strength; (2) improved psychological factors e.g. self-concept; body image; perceptions of self-efficacy; self-esteem; satisfaction; quality of life; and reduced maladaptive behaviour such as aggression; and (3) improved social factors e.g. social competence; popularity; and high levels of parent satisfaction.

Nevertheless, the reviewers concluded that the literature exploring sports involvement for people with intellectual disabilities is narrow, and that further research of greater scientific rigour is needed, including larger sample sizes, adopting replicable methodologies. A lack of consistency of the methodologies used within these studies has been described as limiting comparison, although intervention studies were described as being of moderate scientific quality (Hutzler & Korsensky, 2010). Additionally much of the qualitative research exploring the benefits of sports involvement for people with intellectual disabilities has focused upon parental and coach views, not the participants themselves.

In contrast to the research evidence base the Special Olympics (SO) is a well-known, global organisation with 3.5 million participating members (Special Olympics, 2013). The SO is the main international movement for sport and people with intellectual disabilities and welcomes both children and adults with intellectual disabilities, inviting them to compete in events regardless of skill level. The aims of the SO are to provide quality sports training, and to encourage fitness, commitment and discipline through sport, with the opportunity to participate, train and compete in a wide variety of sports and events. Additionally the organisation promotes the integration of disabled and non-disabled participants through their inclusive sports programme.

Hence, in terms of a context in which to study the psychological benefits of sports involvement the SO offers a unique and potentially rich opportunity. Previous research suggests that the SO offers added value over and above sports participation as a consequence

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of its large organisational infra-structure and well-established supportive culture (e.g. Weiss, Diamond, Denmark & Lovald, 2003). However, this is yet to be examined empirically. The aim of this research was to investigate the relationship of psychological resilience and vulnerability factors of involvement in the SO compared to being involved in sport not through the SO, and no sports activity.

2. Method

2.1 Design

The study employed a cross-sectional design comparing three groups of people with intellectual disabilities; those involved in sport via the SO, those involved in sport but not via the SO and those not involved in sport. The predictor variables were: levels of stress, quality of life and self-esteem, and engagement in social networks. The outcome variable was group membership.

As participation in sports, and especially membership of the SO was predicted to be associated with better psychological health it was hypothesised that high scores on self-esteem, social networks, and quality of life, and low scores on stress would predict group membership.

2.2 Participants

Power calculations were conducted to establish the appropriate sample sizes given the research questions. Past studies comparing three groups of people with similar populations suggested a medium effect size of 0.05 (Clark-Carter, 2010). It has been recommended that a minimum ratio of ten participants to one predictor variable is used for multiple regression analyses (Tabachnick & Fidell, 2001) and for logistic regression consideration is given to potential group size, with the ratio of 10:1 applied to the anticipated smallest group (Vittinghoff & McCulloch, 2007). Applying the null hypothesis of an equal distribution

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between groups this would suggest with the four predictor variables a sample size of 40 in each group.

Participants were drawn from two organisations, the SO and Mencap. Mencap is the leading charity working with people with intellectual disabilities, their families and carers in the UK. It provides help and support through supported living and employment, respite services, organised activities, systemic and individual advocacy, and outreach support, in addition to campaigning for equal rights. Unlike the SO it does not have a specific focus on sport but does prioritise social activities for people with ID, including some sports programmes. As such the sports activities organised by Mencap are more limited than the SO and whilst their competition schedule includes national events, unlike the SO does not include international competition. Hence, the group identification with Mencap tends to be broader than sports and more local compared to the SO, with more informal participation in sports, whereas the main purpose of attendance is engagement in sport, at any level and to join a 'sports focussed' international community. In both groups participants were engaged in a range of individual and team sports, including athletics, football, judo, swimming, bowling and many people participated in multiple sports.

Inclusion criteria for participants in the study were: (1) aged 18 and over; (2) attending services for people with intellectual disabilities, either through the SO or Mencap; (3) able to give informed consent. Participants were allocated to the 'SO' group if they were active participants in the SO participating in at least one hour of organised sport a week. If recruited from Mencap they were allocated to the 'Mencap sport' group if they met the criteria of participating in at least one hour of organised sport a week and participants were allocated to the 'Mencap-no sport' group if they did not meet the criteria of active sports

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involvement. The two Mencap groups were also merged to make comparisons between involvement in the two organisations.

2.3 Measures

2.3.1 Demographic questionnaire

To compare the groups a demographic questionnaire was developed to collect data regarding age, gender, accommodation status, whether participants had paid carers, and employment. Data regarding time per week spent taking part in sport was also gathered in order to assess group membership.

2.3.2 IQ measure

To ensure that the groups were comparable in terms of cognitive functioning a measure of IQ was used; the Wechsler Abbreviated Scale of Intelligence (WASI) (Wechsler, 1997). The WASI is a short, four-subtest version of the WAIS-III, allowing clinicians to form a validated estimate of verbal, performance and full scale IQ. It is explicitly stated in the manual that this is not a diagnostic instrument. It includes subtests similar to those of the WAIS to provide an estimate of full scale IQ. Standardization data is available from a large nationally representative sample of children and adults aged from 6 to 89 years (Wechsler, 1997). An estimate of general intellectual ability can be obtained from the two-subtest form, which was administered in about 15 minutes, providing only the FSIQ (two-subtest) scores. This measure has shown to have good internal consistency, with reliability coefficients ranging from .93 to .98 for the abbreviated two-subtest version, and inter-rater reliability yielded coefficients of .98 and .99 (Garland, 1999). Concurrent validity is good, with $r=.87$ shown in a correlation study between the WASI and WAIS-III (Garland, 1999).

To compare the groups in terms of quality of life, self-esteem, stress and social networks the four following predictor measures were used:

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2.3.3 Quality of life

The Life Experiences Checklist (LEC; Ager, 1998) is a measure that rates an individual's quality of life by gauging the range and extent of life experiences an individual has and compares it with that of the general population. The standard measure has five sub-sections: Home, Leisure, Relationships, Freedom, and Opportunities. For this study only three of the sub-sections were used (Leisure, Relationships, and Opportunities) as they were considered most relevant to the research question and kept the interview time to an acceptable duration. Questions include 'do you have a meal with friends at least once per month?' The 30 questions are read to the participants who respond by stating either 'yes' or 'no'. A pictorial representation of a tick and cross was developed to support this response based on feedback from an initial pilot of the questionnaire. Following completion of the LEC, subsection scores are computed by totalling the 'yes' responses. The measure has been shown to possess good psychometric properties, with an inter-rater reliability of $r=.80$ and a test-retest of .93 (Forrester-Jones, 2004). The LEC demonstrates validity against objective indices of community involvement, has commonly been used to assess quality of life in learning disabled populations, and has been shown to be sensitive to differences between environments (Cummins, 2002).

2.3.4 Self-esteem

To measure self-esteem, the Rosenberg Self-esteem Scale (RSE; Rosenberg, 1965) was used. The RSE has been translated into various languages and is extensively used on cross-cultural studies in up to 53 different nations and is used frequently with the learning disabled population (Schmitt & Allik, 2005; Paterson, McKenzie & Lindsay, 2012). The RSE aims to measure a one-dimensional and global sense of self-esteem using a Guttman scale. The measure includes such items as 'I take a positive attitude towards myself' and 'At times I

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think I am no good at all'. The ten statements are responded to with four options ranging from 'strongly agree' to 'strongly disagree'. Pictorial representations of the response options were created to support this measure. The total score range from 0 to 30, the higher the score indicates higher self-esteem.

Previous researchers have reported adequate levels of internal consistency for their samples with Cronbach's alphas of between .72 and .88 (Byrne, 1996). The test-retest correlation on 28 participants after a two-week interval was .85 (Silber & Tippett, 1965). Rosenberg (1965) reported substantial evidence of the construct/predictive validity of the scale, relating poor self-esteem to behavioural and social outcomes such as loneliness, depression and anxiety. The satisfactory convergent and discriminate validity of the Rosenberg Self-Esteem Scale has been well documented (Blascovich & Tomaka, 1993; Schmitt, & Allik, 2005).

2.3.5 Stress

The Life Stress Inventory (LSI; Bramston & Bostock, 1994) is a self-report measure of daily events or life situations developed for adults with intellectual disabilities. The measure consists of 30 items pertaining to life events. Respondents are asked to listen to each statement and decide if the event has happened to them over recent weeks. If it has, then they are asked to comment on how much stress it caused ('no stress', 'a little', 'a fair bit' or 'a lot'). If the event had not happened then the participant is asked the next question. Pictorial images were designed by the authors of the measure to facilitate participants' responses to items. Total scores range between 0 and 90 - high scores indicate high levels of stress. The measure possesses adequate psychometric properties, with an internal reliability of $\alpha=.8$ and was found to be valid and stable (Fogarty, Bramston & Cummins, 1997). Additionally the LSI has been reported as having adequate internal consistency, and evidence for concurrent and criterion validity (Bramston & Bostock, 1994; Lunsy & Bramston, 2006).

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2.3.5 Social networks

To measure individuals' social networks the Social Support Self Report (SSSR) (Lunsky & Benson, 1997) was used. The SSSR was adapted by Lunsky & Benson (1997) from the Reiss-Peterson Social Support for Mentally Retarded Adults (Reiss & Benson, 1985). The original scale focused upon three areas of support (family, friends and partner). The later version of the SSSR developed a further area concerning care staff. The measure has two components: firstly, the respondents are asked questions about family members, friends, partners and staff to gauge a broad understanding of a person's social support system; and secondly, the quality of each of these relationships is evaluated and scored under four subsections (friends, family, partner/other and staff). The quality of these relationships is measured through questions such as 'How much do you talk to x' and 'How much does x help you with your problems?' A three-point Likert-type scale is used for responses ('not at all', 'sometimes' and 'a lot'). Pictorial images were designed and provided to support making this choice. Total scale scores range between 0 and 80, with high scores indicating high levels of social support.

Concurrent validity was found to be acceptable between the SSSR and Harter's (1985) 'People in my life' scale for scores in the family, friends and partners sections (Lunsky, 2004). When used with a similar client group, the SSSR was shown to have good internal consistency, with Cronbach's alpha of .71, and was found to be generally in accordance with staff perceptions (Lunsky, 2004).

2.4 Procedure

Ethical approval was given by a university's ethics panel. The organisations SO and Mencap were contacted to take part in the study and both agreed to approach their members to explore initial interest. Contact was made through the Special Olympic regional managers via an electronic newsletter, and via Mencap regional managers. The rationale and logistics of the

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study were explained in initial meetings and copies of the information sheet and consent forms were provided. Interested clubs and centres were then contacted to discuss the project once initial interest had been expressed. All participants were given an information sheet and coaches and centre managers asked to assist in making the information accessible. Participants wanting to take part in the study were asked to sign a consent form that had been designed collaboratively with a representative from Mencap who was experienced in designing 'easy read' materials for this population. It was requested that this form was signed at least 24 hours prior to the interviews.

Research volunteers with relevant experience were recruited to assist with data collection. The researchers were trained on the administration of the questionnaires using a specifically designed protocol to help ensure standardised presentation. The battery of questionnaires and visual aids were piloted to check accessibility, completion time and ease of use and no problems were identified. Participants were interviewed at the prearranged venues, which meant they could not be blind to the group to which participants belonged, which was a limitation. Information was gathered on age, gender, accommodation, sports involvement, and measures administered in one setting, taking between 40 and 60 minutes in total. The researchers read out the questions to each participant, as literacy levels were likely to be compromised and so ensure a standard presentation, allowing for assessment of comprehension and additional assistance given if required.

2.5 Data Analysis

The scores from the questionnaires were entered into a statistical software package. Descriptive statistics and tests for normality of distribution were derived. Comparisons between the groups were made on all measures and the demographic age. A correlation analysis was then conducted to ascertain the relationships between the variables. Following

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this, a binary and a multinomial logistic regression analyses were carried out using the forced-entry approach and group membership as the dependent variables.

The RSE, whilst having been extensively used on cross-cultural studies in up to 53 different nations, has been criticised by Kellett and Beail (2009). Based on a study of 219 participants with intellectual disabilities, they suggested two of the ten items (5 - "I feel I do not have much to be proud of" and 8- "I wish I could have more respect for myself) were problematic and clinically had the least face validity of the items. Due to this criticism, the analyses were conducted with and without these items, with no significant differences found. For the purposes of comparison with existing research the results of the full-scale are reported. Nevertheless, researchers should be encouraged to be aware of this issue with the scale, especially if applying it to a sample that is less cognitively able.

3. Results

3.1 Data Description

The mean age of sample was 35.1 years (range 18 to 67), and consisted of 44 female and 57 male participants. A comparison of the Mencap sport and SO groups revealed significant differences between the number of training sessions per week and competitions on a yearly basis, with SO participants engaging in training (as opposed to just participation) on average twice weekly and participation in competitions 2-3 times a year, compared to the Mencap sports group who did not train on a weekly basis and had not participated in competition that year. This represents as expected a higher level of sports engagement in the SO group as this is the main focus of the organisation. Table 1 shows descriptive statistics for all variables and groups. A series of Kolmogorov-Smirnov tests revealed that only the distributions from the Social Support Self Report and Rosenberg Self-Esteem questionnaires were normally

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distributed. Both non-parametric and parametric statistics were used accordingly. Missing data for eight participants reduced the total sample for statistical analyses to 93.

As shown in Table 1 the Kruskal Wallis test was used to explore the differences between the groups on measures not normally distributed. The LEC, not only showed a difference on total scores but also on two (Leisure and Relationships) of the three subscales, the subscale Opportunities showing no between group differences. The LSI also showed a significant difference between the groups. Differences indicated higher quality of life and less stress in the SO group compared to the Mencap Sport and Mencap No Sport groups. No differences were found on IQ as measured on the WASI between the three groups, indicating a similarity of range of impairment. However, it should be noted that over 20% of the sample scored over the usual IQ cut off point of 70 for inclusion in services for people with intellectual disabilities. As IQ is only one component of the diagnosis, the WASI is not a diagnostic tool and these participants are actively engaged in these services which specifically cater for people with ID, they have been included in the data analysis, but this issue will be returned to in the discussion.

For those variables normally distributed a one-way anova indicated a significant difference between groups on self-esteem, with the SO group showing higher self-esteem, but not on social networks as measured by the SSSR. Age was also found to differ significantly with the Mencap No Sport having a higher mean age and so was included in the logistical regressions.

Table 1 here

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Spearman Rho correlations were performed on the data where at least one pairing consisted of non-normative data and a Pearsons' Product Moment correlation was used for the Social Support Self Report and Rosenberg Self-Esteem pairing (Table 2). These tests revealed that Self-Esteem and Life Experience Checklist scores were positively and significantly correlated.

Table 2 here

3.2 Logistic Regression

Firstly a binary logistic regression was carried out to investigate the predictors of group membership between the SO and Mencap (table 3). A test of the full model against a constant only model was statistically significant indicating that the four psychological variables as a set reliably distinguish between membership of SO and Mencap ($\chi^2 = 25.47$, d.f. 5, $p < .000$). Prediction accuracy overall was 79.3% (78.7% for SO and 80% for Mencap). The Wald criterion shows that only Self-Esteem and Life stress made a statistically significant contribution to prediction of group membership.

Table 3 here

To investigate if prediction was based on sports participation as opposed to membership of either Mencap or SO a multinomial logistic regression was carried out dividing the sample into three groups, those who played sport through the SO, those who played sport and were members of Mencap and those who played no sport but belonged to Mencap. The test of the model against the constant was statistically significant suggesting the variables reliably predict group membership ($\chi^2 = 35.36$, d.f. 10, $p < .000$). Prediction accuracy

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was lower in this model with overall 64.1% (53.6% for no sport, 80.9% for SO, 35.3% for Mencap sport). This reflects the distribution of participants across the three groups with 50.5% (N=47) for SO, 30.1% (N=28) for no sport and 19.4% (N=18) for Mencap sport. Hence, caution must be expressed due to the potential low power and unequal distribution between groups. Within the no sport versus the Mencap sport group the only significant predictor was age and none of the four psychological variables predicted Mencap sports involvement within this sample. However, within the SO versus Mencap Sport comparison Self-Esteem was able to predict group membership, but age was not significant, giving some tentative support to the hypothesis that increased self-esteem is more associated with SO membership than involvement in Mencap and participating in some sport, and this is immaterial of age.

Table 4 here

4. Discussion

The results indicate that there is an association between involvement in the SO and reduced stress, increased quality of life, and higher self-esteem. The hypothesis of increased social networks was not demonstrated. The design of the study could not demonstrate causal relationships, so it may be argued that psychologically more robust individuals were involved in the SO and hence it was not participation in the SO itself that had a positive effect on these variables, but selection bias. However, there are a number of results which give some weight to the suggestion that SO involvement does produce added psycho-social benefits and it is not

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merely group selectivity. Firstly, the groups were comparable in terms of cognitive ability as measured by the two sub-test form of the WASI. Also interestingly, of the three subscales of the LEC there were no differences between the groups found in terms of ‘opportunities’ suggesting that those in the Mencap groups were not living a more materially and socially impoverished life than those in the SO group and had similar levels of choice and independence. This suggests that although the three groups had similar opportunities, the SO group were reporting higher scores in relation to both their relationships and leisure experiences.

Scores on the measures of social support, life experiences and self-esteem were all elevated in the Mencap Sport Group, compared to the Mencap No Sport group, however the greatest difference across all measures was seen in the SO group. This suggests that belonging to the SO group carried additional weight over and above pure sports participation. The results of multinomial logistic regression analysis provided some further tentative support to this argument. These findings are also in line with previous research demonstrating that over a 42 month period changes in involvement in Special Olympics predicted improved general self-worth, suggesting not just an associative relationship but a causal relationship (Weis & Bebko, 2008).

Furthermore, the findings of this study support previous research both within the general population (Fox, 1999; McGee, Williams, Chapman, Martin, & Kawachi, 2006) and the learning disabled population (Weiss, Diamond, Denmark & Lovald, 2003) which have suggested that sports involvement is associated with higher levels of self-esteem in particular. Higher self-esteem is an important variable both in terms of one’s general well-being and motivation to be active (Baumeister, Cambell, Krueger, & Vohns, 2003). Self-esteem and social support has a reciprocal relationship, low self-esteem being associated with not seeking support, poor self-care behaviours and increased stress, impacting on social networks and in

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turn reducing self-esteem (Baumeister et al., 2003). Sport has been well-evidenced to reduce stress, including in the learning disabled population (e.g. Carmeli, Barak, Morad, & Kodesh, 2009). The findings of this study lend further support to sport as a positive intervention for both reducing stress and increasing self-esteem in this population.

In contrast to previous research (e.g. Delaney & Keaney, 2005) this study did not find a difference between the groups in terms of social networks as measured by the SSSR. This is surprising, however it was reported by participants that this was the most difficult measure to complete. Interestingly, the 'Relationships' subscale of the Life Experiences Checklist which measures the general quality of relationships surrounding the individual, did indicate higher quality relationships in the SO group. This finding may be related to limitations with the SSSR in administration and scoring, despite it being reported as psychometrically sound and a frequently used measure in the area. Each subsection (friends, family, partner/other or carer) has a limit of two people per section, so whilst an individual may have few family members, they may have several friends, but due to the design of the measure the quantity of friends would not be identified due to the restriction of nominations within the categories, giving a deflated overall score. Hence, the finding of no difference between the groups in relation to social support should be treated with some caution and the results of the LEC might be a better indicator.

Given the centrality of self-esteem to psychological well-being (Baumeister et al., 2003), and the common occurrence of low self-esteem and related mental health difficulties within this population (Emerson & Jahoda, 2012) it is important to identify accessible interventions aimed at elevating self-esteem. Previous research and the findings of this study suggest therefore that involvement in sport could be an effective intervention, in increasing self-esteem in the learning disabled population, even at low levels such as the Mencap sport

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group, and that involvement especially in more intensive sporting activity such as the SO may have added value.

Limitations of this study include the cross-sectional design, which does not enable conclusions to be made about directions of causality. However, the findings of this study are consistent with previous research within mainstream literature suggesting causal directions (e.g. Weiss & Bebko, 2008). Nevertheless, further research using a design which can accommodate causality is required; especially further longitudinal designs involving multiple comparison groups. In addition, the interviewers were not blind to the grouping of participants, however a standard protocol was used, in which they were trained, and not all were familiar with the explicit hypotheses of the study, which will have reduced any potential bias.

Further studies may also consider measuring and reporting the IQ of their sample as this is infrequently reported in similar studies. Whilst the main reason for including a brief measure of IQ in this study was to ensure comparability of groups it did reveal that a large proportion routinely accessing services for people with intellectual disabilities may not qualify if strict diagnostic criteria were to be applied. Two cautions should be added here, one being that IQ is only one recognised component of a full diagnostic assessment (WHO, 2001). Secondly, there may be some measurement issues attached to the WASI suggesting clinical accuracy is lost with the two subtest form, resulting in a possible over-estimation of IQ (Axelrod, 2002). Additionally there is growing concern about the validity of applying strict, unchanging IQ cut-off points in the diagnosis of intellectual disabilities due to issues such as low validation samples at lower abilities, the Flynn effect and the functional arbitrariness of statistically chosen cut off points (Webb & Whitaker, 2012). Likewise it might also be recognised that individuals who may not meet the official entry criteria are getting their needs met by intellectual disability services. This issue points to the alternative

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definitional approach of the social model of disability (Goodley, 2001) which rejects the medical model, and advocates taking a more needs based approach, which is the approach taken in this study.

It is also not clear if there are any factors over and above the level of sports involvement with SO which may be implicated in these positive results and it would be helpful to compare SO participants with other ID athletes such as those involved in the 'International sports federation for para-athletes with intellectual disabilities' (INAS) whose sports involvement is likely to be even more intensive than those individuals involved in the SO. Further research should perhaps also be focussed on the psychological impact on the participants with ID of engagement with a high profile, highly valued, international organisation such as the SO.

Given the difficulty of developing and maintaining healthy exercise habits it is interesting that a difference was found between the two Mencap groups even at the low dosage level of an hour, once a week. Again causality cannot be assumed, but it suggests that low level interventions may prove have an effect and this may be a fruitful further area of research. One hour of exercise a week is a low threshold in terms of intervention and the effects may be stronger for those engaged in more activity. Within this analysis the reduced size of the Mencap Sport group (n=20) compared to the number of predicted variables (5) may have impacted upon the statistical power being lower than the ratio of 10:1. However, Vittinghoff and McCulloch (2007) suggest that under some circumstances this rule may be relaxed and a ratio of 5: may be acceptable with little increase of the risk of error. Finally the age of the groups did differ with the mean in the 'no sport group' being higher perhaps reducing the expectation of continued engagement in sport.

5. Conclusion

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It is well evidenced that people with intellectual disabilities have poorer physical and psychological wellbeing than the broader population. They receive poorer health care, which in turn limits them participating in their communities and contributing to the economy. This study suggests that there are beneficial psychosocial factors that are associated with SO involvement. Such factors have been evidenced as key factors in mental and physical health. Involvement in sports and especially the SO has added value as an intervention to increase psychological resilience. Further research needs to investigate the causal factors implicated in positive outcomes of SO involvement, discriminating between the impact of higher rates of training and competitive engagements and any other added value elements attached to SO involvement.

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Table 1: Descriptive statistics and group comparisons

Groups	Total sample n=101 Mean, (SD), range	Special Olympics n= 51 Mean, (SD), range	Mencap Sport n=20 Mean, (SD), range	Mencap No Sport n=30 Mean (SD), range	Group Comparison	Sig. level
WASI IQ	67.0 (11.9) 55-104	69 (14.1) 55-104	65.9 (10.0) 55-86	63.2 (7.4) 55-75	$X^2(2, 101)$ =1.33	p=.514
Age	35.1 (14.0) 18-67	32.5 (14.0) 17-67	30.5 (12.2) 18-53	41.9 (11.9) 18-61	$F(2, 97)$ =6.27	p=.003**
Life Experience Checklist (LEC)	22.3 (3.9) 10-30	23.4 (3.7) 12-30	21.0 (3.5) 14-26	21.2 (3.7) 10-28	$X^2(2, 101)$ =10.1	p=.006**
Social Support Self Report (SSSR)	38.7 (17.3) 6-80	41.4 (16.9) 6-75	34.6 (15.0) 10-58	36.6 (19.3) 6-80	$F(2, 91)$ =1.35	p=.264
Life Stress Inventory (LSI)	15.6 (12.1) 0-67	11.9 (11.0) 1-67	19.8 (12.6) 0-44	19 (11.8) 0-48	$X^2(2, 97)$ =11.7	p=.003**
Rosenberg Self-Esteem Inventory	20.9 (4.7)	22.4 (4.2)	18.8 (5.6)	19.6 (4.0)	$F(2, 94)$ =6.03	p=.003**

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(RSE)	6-29	12 – 29	6-27	13-28
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Table 2: Two-Tailed Parametric and Non-Parametric Correlations

	2.	3.	4.	5.	6.
1. WASI IQ	0.07 (n=101)	0.00 (n=94)	-0.07 (n=97)	-0.15 (n=100)	0.185 (n=97)
2. Life Experience Checklist	-	0.54** (n=94)	-0.08 (n=97)	-0.098 (n=100)	0.217* (n=97)
3. Social Support Self Report	-	-	0.275** (n=93)	0.025 (n=93)	0.119† (n=93)
4. Life Stress Inventory	-	-	-	0.271* (n=96)	-0.087 (n=97)
5. Age	-	-	-	-	-0.046 (n=96)
6. Self-Esteem	-	-	-	-	-

Note: * $p < .05$; ** $p < .01$, All correlations Pearsons' product moment apart from † (Spearman's Rho).

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Table 3: Binary Logistic Regression with SO or Mencap membership as the outcome variables

	B	SE	Wald (df =1)	Sig.	Exp(B)†	Lower	Upper
Age	.022	.018	1.472	.225	1.022	.987	1.058
Life Experience	-.094	.086	1.191	.275	.910	.769	1.078
Life Stress	.063	.027	5.298	.021*	1.065	1.009	1.123
Social Networks	-.020	.018	1.178	.278	.980	.945	1.016
Self- Esteem	-.142	.059	5.801	.016*	.868	.773	.974
Constant	4.104	2.116	3.761	.052	60.582		

† 95% C.I. for EXP(B)*p<0.05

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Table 4: Multinomial logistic regression with SO, Mencap sport and no sport, as the three outcome variables.

	B	SE	Wald (df =1)	Sig.	Exp (B)†	Lower	Upper
No sport vs Mencap Sport							
Intercept	-5.094	2.790	3.334	.068			
Life Experience	.125	.115	1.187	.276	1.134	.905	1.421
SSSR	-.016	.025	.451	.502	.984	.937	1.032
Self-Esteem	.021	.074	.084	.772	1.022	.884	1.181
Life Stress	.019	.027	.473	.492	1.019	.966	1.075
Age	.078	.028	7.762	.005**	1.081	1.023	1.143
Special Olympics versus Mencap Sport							
Intercept	-.6727	2.821.	5.685	.017			
Life Experience	.173.	.113	2.359	.125	1.189	.953	1.482
Social Networks	.010	.023.	.174	.677	1.010	.965	1.057
Self-Esteem	.161	.074	4.759	.029*	1.175	1.016	1.358
Life Stress	-.053.	.031	2.825	.093	.949	.892	1.009
Age	.031	.027	1.288	.256	1.032	.978	1.088

† 95% C.I. for EXP(B)

*p<0.05

**p<0.01