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Educational inclusion in Singapore for children with physical disabilities

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ABSTRACT

Under Singapore's inclusive education policy, children with mild physical disabilities are integrated into mainstream schools. There is currently no known published research yet in Singapore on the outcomes of inclusion for children with physical disabilities. Internationally, recent research had compared the school experience of children with physical disabilities to that of their typically developing peers. This study examined the social and academic impact of educational inclusion for children with physical disabilities. It investigated how their participation in school activities, academic performance, self-esteem, peer relationships, and social/emotional development compared to that of typically developing schoolmates. A total of 60 clients (n = 30 with physical disability; n = 30 typically developing students; age range = 8 to 16 years) in a local primary and secondary regular school participated in the study. The children with physical disabilities met academic expectations in school and had comparable levels of self-esteem, but experienced peer problems and participated less in school activities. Understanding children's overall school experience is critical to becoming an inclusive society that enables children with a range of disabilities to benefit academically and socially. Implications for practice and future research were discussed.

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Introduction

The term "inclusion" gathered momentum in the 1990s on the wings of the Salamanca Statement of 1994 (United Nations Educational, Scientific, and Cultural Organization [UNESCO], 1994), which advocated for all children to be enrolled in regular schools unless there were compelling reasons for doing otherwise. The Salamanca Statement launched an educational movement worldwide that granted children with special needs, in principle, access to equal opportunities for education and training. Although inclusion is defined and applied differentially across countries, in the context of education, it can broadly be defined as the practice of educating students with special needs in mainstream or regular schools (Wilde & Avramidis, 2011). Beyond physical emplacement within a mainstream setting, inclusion is regarded as a process where systematic barriers to learning and participation are reduced, where every student is welcomed, valued and supported, and more importantly, where relationships are intentionally fostered (Booth & Ainscow, 2002). Although this article focused on educational inclusion, inclusion is more than just about children with special needs receiving an education in a regular school

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setting. Inclusion is about building a cohesive society where every member is able to take part in all aspects of life. Social inclusion is the process of improving the terms on which individuals and groups take part in society – improving the ability, opportunity, and dignity of those disadvantaged on the basis of their identity (The World Bank, 2017). In the context of education, inclusion means adapting the mainstream classroom (e.g., modifying instructional strategies and learning tasks) to accommodate the needs of individuals with disabilities and facilitate deeper participation in normal learning activities in order to fulfil their potential as learners.

Although extensive research has been conducted internationally on the barriers and supports of educating children with special needs in the least restrictive environment and including them in general education settings, less is known about how well their academic and social needs are addressed. How similarly do students with disabilities participate in school activities and make gains in social skills compared to students with typical development with whom they share the same school and/or class environment?

The Singapore education system has included children with mild special needs in mainstream schools. However, little is known about how well students with physical disabilities (PD) in Singapore are faring in a regular education setting. Hence, the goal of this study is to examine how students with PD compare with their typically developing (TD) peers in academic performance, self-esteem, and peer relations. A physical disability is an orthopaedic impairment that may interfere with a person's coordination and mobility, and affect his or her ability to participate in activities in school or at home (Koh & Poon, 2007). Among school-aged children, the more common physical disabilities include cerebral palsy, spina bifida and hydrocephalus, and muscular dystrophy. Individuals with physical disabilities may also have sensory impairments (e.g., visual or auditory), neurological problems or learning difficulties. The different levels of severity may range from the inability to talk, walk, point, or move purposefully, to merely difficulty in walking, or to an unseen skeletal abnormality (Koh & Poon, 2007). Self-esteem is a person's evaluation or judgement of his or her worthiness (Rosenberg, 1989). Peer relations refer to a person's interactions with others of the same age and development with whom there are no family ties (Peterson, 1989); peer acceptance and friendship work together to form peer relations (Bukowski & Hoza, 1989).

The literature review to follow covers children with disabilities, and where possible, a closer look at children with PD, the special needs group in this study. It then reviews first, the impact of disabilities (physical and others) on academic and social functioning; second, comparisons between children with PD and their TD peers; third, a brief discussion on educational inclusion in Singapore which provides the background to this study.

Impact of disabilities on academic and social outcomes

Having a physical disability can affect an individual's learning and social development. Cerebral palsy, a disorder that affects muscle control and coordination, often results from brain damage or brain malfunctions before, during, or after birth, and can lead to varying degrees of learning disabilities and problems with vision, hearing, and speech. Children with cerebral palsy may need extra time to complete their school work or examinations as their speed of writing and typing may be slower compared to their peers on account of their fine-motor impairments (Nonis, 2008). Lessons in science laboratories that require heating materials or carrying out fine dissection may pose safety concerns for students with PD who have great difficulty with fine-motor movement and coordination (Tan & Towndrow, 2008). Spina bifida, a congenital defect of the spinal column that leads to damage to the spinal cord and nerves, can cause fine-motor problems as well as mental disabilities (Koh & Poon, 2007). Students who have a physical disability that impacts brain functions may encounter difficulties in remembering and retaining information, focusing and concentrating during lessons, speaking clearly, copying from the board, taking notes or writing legibly, and organizing learning materials. These challenges can pose problems in learning. Students with PD may need wheelchairs, crutches, braces, or walkers to move about in school. Limited mobility can restrict their access to the classroom, learning spaces, physical education programmes, field trips, and school camps, and reduce opportunities for social interaction.

There is encouraging research that shows that including children with disabilities in mainstream schools has led to benefits in terms of academic rather than social progress (Bax, 1999). Sebba and Sachdev (1997) reported that children with identified disabilities who studied in schools that developed inclusive education made significant gains in reading, language, study skills, and living skills. Children with cerebral palsy made better academic progress within the mainstream setting (Butler, 2001). Preschoolers with disabilities attending an inclusion class obtained higher post-test scores in language as compared to a special needs class (Rafferty, Piscitelli, & Boettcher, 2003).

In peer relationships, inclusion in general education has some social benefits for children with disabilities. Fisher and Meyer (2002) reported that after two years of mainstream education, children with severe special needs (e.g., cognitive impairments in combination with motor and/or sensory impairments) made significant gains in social competence (specifically, in initiating contact and coping with negative situations) relative to peers in self-contained programmes. Fryxell and Kennedy (1995) found that children with severe disabilities in an inclusive setting had larger friendship networks, higher social contact with TD peers, and enjoyed a higher level of social support. Yet, the research has been consistent in showing that children with disabilities experienced a lower social status (i.e., they are less well received or liked by their peers). They were less accepted and often rejected by their TD peers (Larrivee & Horne, 1991). An American meta-analytical review of 17 studies revealed that pupils with special needs had significantly lower social status (i.e., less popular) than their peers in regular education (Ochoa & Olivarez, 1995). This phenomenon tends to be more prominent among secondary than elementary school children with disabilities. In the adolescent years, secondary school students who are developing their sense of identity have a strong need to belong to a social group; hence, they tend to identify with peers more similar to themselves than those who deviate from the norm (Bax, 1999).

The literature showed mixed outcomes in research that examined the self-esteem of children with disabilities. In general, it appears that the impact on self-esteem is affected by both the presence and severity of the physical disability. A study on children and adolescents with mobility impairment found a large negative impact on self-esteem in relation to physical competence for those with minor physical disabilities (Jemta, Fugl-Meyer, Oberg, & Dahl, 2008). They tended to evaluate themselves lower on physical characteristics. This could be attributed to social comparison when physically disabled children with less severe conditions identified with TD peers and were faced with demands both from themselves and the large social community (Jemta et al., 2008). In contrast, a study on children with spina bifida found that greater severity of the disability was associated with increased self-esteem in physical appearance and global self-worth (Minchom et al., 1995). A possible explanation is that children with major PD tended to receive attention, empathy, and practical support (Miyahara & Piek, 2006).

Students with physical disability and typically developing peers

Research studies in recent years have made comparisons between children who have PD and their TD peers in terms of their activity participation patterns and social networks. Two Australian studies that employed a cross-sectional, matched, multi-group, comparative study design made comparisons amongst children aged 10 to 15 years who had complex communication needs (CCN), PD, and typical development (Raghavendra, Olsson, Sampson, Mcinerney, & Connell, 2012; Raghavendra, Virgo, Olsson, Connell, & Lane, 2011). Children who had complex communication needs used augmentative and alternative communication (e.g., communication books, simple and /or complex speech-generating devices) to aid them in communication. Raghavendra, Virgo, et al. (2011) compared the social context and location of participation in "out-of-school" activities and found that TD children engaged in nearly 51% of all activities, such as team sports and skill-based activities, both within and beyond their communities. In contrast, children with PD and children with CCN participated in activities in limited locations that were closer to home (i.e., school, neighbourhood or home) owing possibly to smaller social networks, problems with transportation, and the need for a caregiver to provide support (Raghavendra, Virgo, et al., 2011). Raghavendra, Olsson, et al. (2012) compared the school participation and social networks of a smaller sample of 39 children who belonged to these three above-mentioned

groups. The study revealed that with respect to school participation, doing the same activity as peers was lowest for children with CCN, higher for children with PD, and highest for TD children. In addition, whereas typically developing children conversed and socialized continuously with peers both in and out of class, and in broader locations, children with PD were observed to do the same but at a lower frequency and intensity (Raghavendra, Olsson, et al., 2012). In another study, Woodmansee, Hahne, Imms, and Shields (2016) compared participation in physical recreation activities between children aged between six and 17 years who had physical, intellectual, sensory or multiple disabilities and children with typical development. The study found that children with disability participated more in swimming and less often in team sports and games; a higher percentage also played games at home compared to TD children. More children with PD than TD children reported not engaging in their preferred activities (i.e., athletics, team sports, individual physical activities, non-team sports). They also needed companionship during participation and were less likely to participate in day-to-day physical recreation (e.g., walking or biking) independently (Woodmansee et al., 2016). The above studies were undertaken in a variety of educational settings that included special schools or special classes within mainstream schools. None of the above studies compared children with disabilities and children with typical development exclusively in an inclusive school environment.

Educational inclusion in Singapore

In Singapore, children with mild special needs are included in mainstream schools. For more than 10 years, phenomenal effort has been put into creating the infrastructure and training teachers and Allied Educators (or teacher-aides) to provide children with mild special needs the support they need to learn alongside their TD peers.

It is the authors' view that inclusive education, as it is currently practised in Singapore, is integration (Anderson, Klassen, & Georgiou, 2007) rather than full inclusion. A specific state of inclusion has evolved in Singapore that is consistent with an education system that seeks to maximize the potential of every student. Students with mild disabilities attend regular schools where they learn with some adaptation and resources. Their special learning needs are supported in a variety of ways that may include a pull-out system with individualized instruction in the mainstream setting or the provision of a teacher-aide in the classroom. On the other hand, students with severe disabilities attend special schools that are segregated from the mainstream. This dual system with a mix of special and regular schools is different from inclusion in countries such as the US and the UK where children with a range of disabilities are educated in the same classroom as other same-aged children in regular schools. The Salamanca Statement calls on all governments "to adopt the principle of inclusive education and to enroll all children in regular schools unless there are compelling reasons for doing otherwise" (UNESCO, 1994, p. 9). The Singapore education system has yet to attain the standards for inclusive education as embodied in the Salamanca Statement.

Presently, there is a move towards greater educational inclusiveness. The effort of the Singapore government in supporting persons with disabilities is evident in the Enabling Masterplans, which are five-year national roadmaps that guide the development of policies for individuals with special needs (Ministry of Social & Family Development, 2016). The first two masterplans launched in 2007 and 2012 focused primarily on early childhood education and employment opportunities. The most recent masterplan – Enabling Masterplan 3 (2017–2021) – put stronger emphasis on improving the quality of life for persons with disabilities with proposals focused on supporting caregivers and building the community to strengthen inclusion. In December 2016, the Compulsory Education Act was extended to include children with special needs. This means that children with special needs, including those with moderate to severe conditions, will need to attend publicly-funded schools from 2019, just like all other children in Singapore (Singapore Ministry of Communication & Information, 2016). This is a move committed to promote greater educational inclusiveness.

In the existing literature, few studies have examined the outcomes of inclusion for children with PD in comparison to their TD schoolmates. The primary purpose of the study was to gain insight into the

academic outcomes and social outcomes of inclusive education for children with PD relative to their TD peers. Thus, this study sought to extend the local and international literature on educational inclusion to an under-studied population of children with PD in particular and children with special needs in general.

Specifically, the study's objective was to ascertain how children with PD compared with TD peers in the following areas: (1) participation in school activities such as physical education (PE), co-curricular activities (CCA), and school camps; (2) meeting academic expectations; (3) self-esteem, peer relations, and behavioural, emotional, and social development. We hypothesized that compared to their TD peers, children with PD would have a lower participation rate in school activities, would perform comparably with their TD peers in academic performance, and would show poorer adjustment in self-esteem, social and behavioural/emotional outcomes.

Methodology

Procedures

Ethics clearance and approval for this study were provided by the Nanyang Technological University Institutional Review Board, the Singapore Ministry of Education, and the Asian Women's Welfare Association (AWWA). Written informed consent for participation was obtained from the children's parents and teachers. The children gave verbal assent.

The study employed a cross-sectional survey design that examined existing differences between children with PD and TD children at a particular point in time. The children completed the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1989), the Index of Peer Relations (IPR; Hudson, 1982), and a brief demographics form. They indicated in the demographics form the marks they had obtained for English and Mathematics in the previous year's final examination. They were given instructions for completing the questionnaires and invited to ask questions if they had any. They were reminded that there were no right or wrong answers, and to respond to each survey item as truthfully and accurately as possible. The form teacher of each child completed the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997).

Participants

Thirty students had physical disabilities and another 30 had typical development (see Table 1). Children in the PD group (M = 12.58 years, SD = 2.40 years) were clients of AWWA Therapy and Educational Assistance in Mainstream Education (TEACH ME), a voluntary welfare organization in Singapore that caters to children with disabilities. The criteria for the PD group to be included in the study were: a formal diagnosis of a physical disability such as orthopaedic and musculoskeletal disorders and neurological motor impairments, no indication of intellectual impairment, and age ranging from 8 years 0 months to 16 years 11 months. The PD sample consisted of children with cerebral palsy (n = 15, 50%), Duchenne muscular dystrophy (n = 8, 26.7%), dyspraxia (n = 3, 10%) and other neurologically-related disorders (n = 4, 13.3%). Eighteen children in the PD group were studying in regular primary schools and 12 in regular secondary schools. The children in the TD group (M = 13.5 years, SD = 1.39 years) were a convenience sample from two regular schools that consented to participation at our request. They were selected by the teachers based on the criteria that they were between 8 years 0 months and 16 years 11 months, with no indication of intellectual impairment or other special needs. Out of this TD group, 18 children were from one primary school and 12 from one secondary school.

Instruments

Rosenberg Self-Esteem Scale (RSES)

The RSES is a 10-item self-rating scale that measures self-esteem. Originally developed as a Guttman scale, the RSES is now commonly scored as a 4-point Likert scale ranging from "strongly agree" to

Table 1. Demographic data of the PD ($n = 30$) group and the TD group ($n = 30$).

	Physically Disabled (PD)	Typically Developing (TD)
Gender		
Male	20	20
Female	10	10
Age (in years)		
8	1	0
9	4	0
10	4	0
11	3	2
12	3	16
13	2	1
14	6	5
15	5	4
16	2	2
School Year		
Primary 3	5	0
Primary 4	5	0
Primary 5	5	0
Primary 6	3	18
Secondary 1	0	0
Secondary 2	9	6
Secondary 3	2	5
Secondary 4	1	1
Camps attended		
None	24	4
1	4	15
2	1	1
3 or more	1	10
Attend PE lessons	14	30
CCA Participation	15	21

"strongly disagree". The scale had high reliability with test-retest correlations typically in the range of 0.82 to 0.88, and Cronbach's alpha for various samples in the range of 0.77 to 0.88 (Rosenberg, 1989). For the present study, Cronbach's alpha was 0.77, which fell within an acceptable range of reliability.

Index of Peer Relations (IPR)

One of nine scales that make up the Clinical Measurement package (Hudson, 1982), the IPR is a 25-item self-report questionnaire that measures the degree, severity or magnitude of problems that an individual is experiencing in relationships with peers. The children rated themselves on a 7-point scale ranging from 1 (None of the time) to 7 (All of the time). The IPR can be administered with respect to peer relations within the individual's school context. The IPR produces a score ranging from zero to 100 where a low score indicates the relative absence of the problem being measured, and a higher score indicates the presence of a more severe problem. The cut-off score of 30 indicates a clinically significant problem, whereas a score of 70 or higher may indicate the experience of severe distress. The scale is known to be internally consistent with a reliability alpha of 0.94. Cronbach's alpha for this study was 0.96, indicating that the scale is highly reliable.

Strengths and Difficulties Questionnaire (SDQ)

The SDQ is a 25-item behavioural screening questionnaire for assessing the psychological adjustment of children and youth aged three to 16 years (Goodman, 1997). Psychological attributes are measured on five scales: emotional symptoms, conduct problems, hyperactivity-inattention, peer problems, and prosocial behaviour. Teachers rated the children on a 3-point Likert scale (not true, somewhat true, certainly true) to indicate how far each attribute applied to the target child. The total difficulties score is the sum of all the scaled scores, except the prosocial behaviour scale. Hence, high scores on the scales measuring emotional symptoms, conduct problems, hyperactivity-inattention, and peer problems

indicate greater difficulties observed of the participant. Conversely, on the prosocial behaviour scale, lower scores indicate poorer prosocial behaviour observed. The scale has been reported to have a reliability alpha of 0.73 (Goodman, 1997). Cronbach's alpha for this study was 0.74, which was within the acceptable range of reliability.

School semestral assessment (SA2) marks

SA2 marks were obtained at the end of the academic year. Only the English and Mathematics grades were measured as they best indicate fundamental literacy and numeracy skills for future employment. Scores were assigned as follows: "0 = <C grade, 1 = C grade, 2 = B grade, 3 = A/A+grade". Higher scores indicate stronger academic performance.

Data analysis

All results obtained were analysed quantitatively using the PASW Statistics version 18 (PASW 18.0). An alpha value of 0.05 was used for all statistical tests.

Chi-square tests for independence (with Yates Continuity Correction) were employed to compare the participation rates of children with PD and their TD peers in PE, CCA, and school camps. Independent samples *t* tests were conducted to explore whether there were significant differences between the two groups of children in their grades, self-esteem, peer relations, and social, emotional, and behavioural difficulties.

In the present study, Cohen's *d* was utilized in reporting effect sizes where *t*-tests were conducted. Effect sizes indicate the extent of an effect or the strength of the relationship between variables (Cohen, 1988). A value of less than 0.2 indicates a small effect size; a value of between 0.2 and 0.8 indicates a moderate effect size; a value of more than 0.8 indicates a large effect size. The phi coefficient was used in reporting effect sizes where chi square tests of independence were conducted. By convention, phis of 0.10, 0.30, and 0.50 represent small, medium, and large effect sizes, respectively (Rea & Parker, 1992).

Results

This study examined the overall school experience of children with PD who were studying in regular or mainstream schools in Singapore. It investigated how their experience compared with that of TD children in participation in school activities, academic performance, self-esteem, peer relations, and behavioural, emotional, and social difficulties.

Participation in school activities

It was hypothesized that children with PD would have a lower participation rate than their TD peers in school activities, specifically PE, CCA, and school camps. The findings showed that only 46.7% (14/30) of the PD group participated in PE lessons as opposed to 100% of the TD group (see Table 2). A chi-square test for independence (with Yates Continuity Correction) indicated a significant association between PE and disability status (i.e., PD versus TD) with a large effect size, χ^2 (1, 60) = 19.18, $p < .001$, *phi* = –.60. CCA participation rate of the PD group was 50% (15/30), which was lower but not significantly different from the 70% rate for the TD group (21/30), χ^2 (1, 60) = 1.74, $p = .19$, *phi* = –.20 (see Table 2). Attendance at school camps was lower for the PD than the TD group. Attending at least one school camp for PD group was 20% (6/30) compared to 86.7% (26/30) for the TD group. An independent samples *t*-test found a significant and large difference in school camp attendance, $t(58) = -5.30$, $p < .01$, $d = 1.39$ (see Table 3).

Academic outcomes

Second, it was hypothesized that children with PD who were included in regular school would not differ from their TD peers in English and Maths performance. Similar to their TD peers, children with

Table 2. Frequencies and percentages on students' participation in physical education (PE) and co-curricular activities (CCA).

	PE	No PE
Physically Disabled	14(46.7)	16(53.3)
Typically Developing	30(100)	0(0)
	CCA	No CCA
Physically Disabled	15(50)	15(50)
Typically Developing	21(70)	9(30)

Note: Numbers in parentheses represent percentages.

Table 3. *T*-Test for students' participation in school camps, performance in English and Maths, self-esteem, and peer relations.

	Participants				
	Physically Disabled (n = 30)		Typically Developing (n = 30)		
	Mean	*SD*	Mean	*SD*	*t*(58)
School Camps	1.30	0.70	2.57	1.10	−5.30**
English	2.37	1.25	2.07	0.83	1.09
Maths	2.33	1.25	2.97	1.03	−2.18*
Rosenberg Self-Esteem Scale	19.47	4.74	17.6	3.88	1.67
Index of Peer Relations	77.53	36.38	65.33	21.13	1.59

**$p < .01$; *$p < .05$.

PD obtained at least pass grades in both the year-end English and Maths examinations. The PD group performed better in English than the TD group but the difference was not significant, $t(58) = 1.09$, $p = .28$. However, they obtained significantly lower scores in Maths than the TD group, $t(58) = -2.18$, $p < .05$, $d = .57$ (medium effect size) (see Table 3).

Self-esteem, peer relations, social and behavioural/emotional outcomes

Third, it was hypothesized that there would be differences between PD and TD children in self-esteem, social and behavioural/emotional outcomes with PD children showing poorer adjustment. Contrary to our hypothesis, the PD group reported higher self-esteem relative to their TD peers although the difference was not significant, $t(58) = 1.67$, $p = .10$ (see Table 3). However, they self-reported having poorer peer relations, albeit not significantly worse, than their TD peers, $t(58) = 1.59$, $p = .12$ (see Table 3). The teachers rated the PD children as having significantly more peer problems [$t(58) = 2.86$, $p < .01$, $d = .75$] and displaying fewer prosocial behaviours [$t(58) = -3.63$, $p < .01$, $d = .95$] than the TD children (see Table 4). Teachers did not report differences between these two groups of children with respect to emotional difficulties, conduct problems, and hyperactivity.

Discussion

This study provides results that make contributions to the research on educational inclusion of children with physical disabilities in three ways. First, this may be one of the earliest studies in Southeast Asia to take a close look at the outcomes of including children with PD in a regular school setting. This study offers preliminary empirical evidence on the academic and social outcomes for children with PD who are schooled alongside their TD peers.

The experience of Singaporean children with PD was similar to that of other children with PD that revealed reduced participation in physical activities (Blinde & McCallister, 1998; Parkes, McCullough, & Madden, 2010). Relative to their TD peers, most of the children with PD reported fewer opportunities to meaningfully take part in PE or were excluded from PE. They also attended fewer school camps and engaged in fewer co-curricular activities. Parkes et al. (2010) who conducted a study on children with

Table 4. *T*-Test for teachers' ratings of students on the strengths and difficulties questionnaire.

	Participants				
	Physically Disabled (n = 30)		Typically Developing (n = 30)		
Scale	Mean	*SD*	Mean	*SD*	*t*(58)
Total Difficulties	9.77	6.55	7.21	6.91	1.48
Emotional Symptoms	2.41	1.96	1.97	2.27	0.79
Conduct Problems	1.13	1.68	0.77	1.43	0.91
Hyperactivity	2.97	2.68	2.91	2.63	0.10
Peer Problems	3.27	2.53	1.57	2.05	2.86**
Prosocial Behaviour	6.13	2.54	8.21	1.81	−3.63**

**$p < .01$.

cerebral palsy, a condition which characterized 50% of the PD sample in the present study, also found that when compared to their TD peers, children with cerebral palsy had significantly reduced frequency of participating in community activities, games, and sports, as well as non-sporting activities. It is possible that children with PD declined participation in physical activities due to lack of interest. It is also possible that PE and games present major problems if adaptations are not made that will enable them to participate without feeling exposed or frustrated by the demands of the activities and the routines associated with them. That they participate less or not at all in PE can be related to the struggles that PE teachers face at fully accommodating students with disabilities in an inclusive setting. Research has also shown that PE teachers encounter challenges accommodating students with disabilities in PE lessons and do not feel prepared to teach in an inclusive setting (Block & Obrusnikova, 2007; Jerlinder, Danermark, & Gill, 2010). In a recent American study, large class size and limited adapted equipment were the two top barriers to teaching PE to students with disabilities. Among the most difficult students for PE instruction, students with PD ranked third after students with autism and behavioural disabilities (Lirgg, Gorman, Merrie, & Shewmake, 2017). Lower participation in physical activities removes children from active engagement with their schoolmates. This is a matter of concern as children with PD value opportunities to gain friends and maintain friendship ties as much as their TD peers. Fewer activities with peers also results in lower social interaction and development of age appropriate social behaviours (Raghavendra, Virgo, et al., 2011). Similarly, in this study, the children with PD were less participative in PE, camps, and co-curricular activities, which limited their opportunities to socialize with their peers.

In the aspect of academic performance, Singaporean children with PD met academic expectations of passing English and Maths. Similarly, in a systematic review of 26 studies on the inclusion of pupils who had difficulties in learning or cognition, none of the studies reported negative academic impact when the included children had physical or sensory difficulties (Kalambouka, Farrell, Dyson, & Kaplan, 2005). It may well be that both PD students and their TD peers met academic expectations owing to the emphasis Singapore society places on academic success.

Second, the findings of the study challenge the conventional stereotype surrounding the self-esteem of individuals who have PD. Singaporean children with PD in fact reported higher self-esteem than their TD peers. This outcome echoes that of other studies that suggest that the self-esteem of young people with PD is not necessarily low (Llewellyn, 2001). Healthy self-esteem can be attributed to the children's supportive home and school environment. More likely, in the area of academic performance, children who are included in regular school are as able as their TD peers in accessing the curriculum, and doing well in school gives them a sense of accomplishment. Trepanier-Street, Hong, Silverman, Keefer, and Morris (2011) also found that children with disabilities felt more competent as learners because of their experiences of academic success.

Third, the study highlights and reiterates the importance of meeting the social needs and supporting the social development of individuals with PD. Singaporean children with PD self-reported having poorer peer relations. This perception was shared by their teachers who reported that children with PD had more peer difficulties, evident in being picked on or bullied by other children, and displayed

less prosocial behaviours, such as being considerate of other people's feelings. What is striking is the consistency with which peer problems has emerged as a significant issue for individuals with PD in the literature. As they are perceived to be different, they tend to be ostracized, to lack friends, and to be bullied (Dorries & Haller, 2001; Llewellyn, 2001; Yude & Goodman, 1999). A study by Curtin and Clarke (2005) found that children with PD ranging in age from 10 to 13 years struggled to develop friendships and felt lonely and excluded despite being included in a regular school. Children with PD may also appear less prosocial for a few reasons. They have limited social interactions and hence limited opportunities to display prosocial behaviours. Given their poor physical condition, they have less autonomy in organizing and introducing change to their daily lives, tasks for which parents or caregivers often assume responsibility; thus they may be limited in their ability to demonstrate prosocial behaviours. Yet, there is research evidence that children with PD have a preference for social activities (Shields, Synnot, & Kearns, 2015), which represents a real need to connect with others in substantive and meaningful ways. Perhaps, it is in receiving friendship and forging strong peer relationships that child and youth, TD or otherwise, acquire prosocial skills.

What then are the implications for practice? First, within and beyond the classroom, teachers can structure opportunities for social interaction, such as adopting a cooperative learning framework that has the potential of fostering the habit of group accountability for learning and success for all members. An earlier study by Yeo, Chong, Neihart, and Huan (2016) found that children with special needs can be full members of the general education classroom when teachers actively teach their pupils how to be supportive of peers who are different from themselves. Teachers can also consider availing opportunities to children with PD to assume lead roles in class-wide programmes or community projects where their strengths can be tapped. Second, more can be done to equip teachers with knowledge and skills about the management and support of children with PD (e.g., matching the ability of the child to the tasks given so that children with PD can participate and contribute on an equal basis) to allow broader access to PE, co-curricular, as well as social activities. Third, compared to their TD schoolmates, children with PD have fewer and limited choices when it comes to participating in physical and social activities. Rather than expecting children with PD to fit into existing structures, schools will need to work at removing barriers and increasing support systems that will allow them to participate more fully in school life and to develop their potential.

Limitations

A convenience sample and limited external validity meant that the findings of this study cannot be generalized to other PD and TD populations both locally and internationally. The small sample size also reduced the power of statistical analysis for establishing significance. Further studies employing randomized designs with larger sample sizes, with the target group consisting of clients from various organizations catering to physical disabilities and a wider comparison group of TD children, are warranted to validate these findings.

Although the self-rated questionnaires completed by the TD group were submitted directly to the researcher who administered them at the school, submission by the PD group was made through the children's parents. Hence, it is not known whether the responses of the PD group were based on their own feelings or included their parents' as well. The point is that self-reports are susceptible to social desirability biases and impression management. In addition, as the participants were only rated by one teacher (their own form teacher), possible demand effects such as experimental bias were not controlled for.

Conclusion

In conclusion, the results provide a reality check of what inclusion looks like from the perspective of children with PD who are schooled in the regular school setting with TD children. The study is interesting for the insight it sheds on the lived social experience of children with PD in an under-studied population

of Southeast Asian elementary and secondary school children. Results add to the literature by reiterating the poorer social outcomes experienced by children with PD despite being in regular school and demonstrating positive academic progress. It also points to the need to plug the weak social link that disconnects individuals with PD from full participation in community life. The way forward for future studies may be to consider strategies to strengthen the social integration of children with PD. Until that happens, children with PD "can be 'in' but not 'of' the class in terms of learning and social membership" (Ferguson, 2008, p. 111) in the regular classroom and larger social environment.

Disclosure statement

No potential conflict of interest was reported by the authors.

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