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A Descriptive Profile of Physical Education Teachers and Related Program Characteristics in Alberta

A survey of teachers and principals in Alberta was conducted to gain a descriptive profile of who is teaching physical education (PE) and to assess the relationship between PE specialists and variables associated with program delivery. A probability-sampling procedure was used to obtain a representative sample of schools. In these schools nonprobability procedures were used to recruit teachers. A total of 480 teachers' and 162 principals' questionnaires were returned. Although 50% (n=236) of PE teachers in the sample were classified as PE specialists (i.e., had either a degree, major or minor, in PE or a closely related area), there was a significant gap in the number of PE classes being taught by division. Of the 1,219 PE classes surveyed in this study, PE specialists taught 49% and 55% of classes at the elementary levels (Divisions I & II) compared with 91% of junior high (Division III) and 90% of secondary (Division IV) PE classes. Significant differences were found between PE specialists and non-PE specialists on a number of items including perceptions of preparedness, teaching enjoyment and competence to teach PE, the number of PE specialists across grade levels, and the percentage of time devoted to PE in the timetable. Implications with respect to implementing PE specialists across all grades and the need for future pedagogical research to investigate the effect of PE specialists are also discussed.

Une enquête a été entreprise auprès d'enseignants et de directeurs d'école en Alberta dans le but d'établir un profil descriptif des enseignants d'éducation physique (EP) et d'évaluer le rapport entre les spécialistes en EP et les variables associées à l'exécution de programmes. On a eu recours à une méthode d'échantillonnage au hasard pour obtenir un échantillon représentatif des écoles. Par la suite, on y a employé des procédures non probabilistes pour recruter des enseignants. En tout, 642 questionnaires (480 provenant d'enseignants et 162 de directeurs) nous ont été renvoyés. Alors que 50% (n=236) des enseignants de EP de l'échantillon se classaient comme spécialistes en EP (c'est à dire qu'ils avaient soit un diplôme, une majeure ou une mineure en EP ou dans un domaine connexe), un écart notable existait dans le nombre de cours de EP enseignés par division. Des 1 219 cours de EP inclus dans l'enquête, à l'élémentaire, 49% (Division I) et 55% (Division II) d'entre eux étaient enseignés par des spécialistes en EP. Au secondaire

premier cycle (Division III), 91% des cours étaient enseignés par des spécialistes en EP; au secondaire (Division IV), 90% des cours l'étaient. Des différences importantes distinguaient les spécialistes en EP des non spécialistes, y compris leurs perceptions quant à leur état de préparation, le plaisir qu'il retirait de l'enseignement de l'EP, leur compétence à le faire, le nombre de spécialistes en EP à tous les niveaux scolaires et le nombre d'heures consacrées aux cours de EP. Une discussion portant sur les implications de la mise en place de spécialistes en EP à tous les niveaux scolaires et sur la nécessité d'étudier l'effet qu'exercent ceux-ci, termine l'article.

Concern is growing that a sedentary lifestyle poses significant health risks to children (Andersen, Crespo, Bartlett, Cheskin, & Pratt, 1998). Recent reports (Craig, Cameron, Russell, & Beaulieu, 2001; Tremblay & Wilms, 2000; United States Department of Health and Human Services [USDHHS], 1996) reveal that many North American youth are not active enough to experience the beneficial effects of physical activity. Over half of Canadian children and youth aged 5 to 17 are not active enough for optimal growth and development (Craig et al., 2001). Hypoactive children have a greater risk of becoming sedentary adults (Pate, Baranoski, Dowda, & Trost, 1996; Taylor, Blair, Cummings, Wun, & Malina, 1999), and there is a strong correlation between physical inactivity and an increased risk of cardiovascular morbidity and mortality among adults (Rowland, 1990). The cost of such inactivity on Canada's health care system has been estimated to be above five billion dollars (Katzmarzyk & Janssen, 2004).

Many are now turning to schools as the place where such trends can be reversed. For example, both national (Canadian Medical Association, 1998) and provincial (Ontario Public Health Association, 2002) health organizations are now actively lobbying for mandatory daily physical education (PE) in Canadian schools. School-based PE has been recognized as an effective approach for enhancing the overall health of children by providing them with the opportunity to develop lifelong skills and knowledge related to being physically active (Centers for Disease Control and Prevention, 2001). Many Canadian (Luke,

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2000) and US (Chepko & Arnold, 2000) health and PE curricula now contain learning and skill-based outcomes that encourage and foster an active healthy lifestyle. Recent data suggest, however, that many students are not receiving adequate amounts of PE to develop the necessary skills to be physically active for a lifetime.

The World Health Organization (2000) reported that only a few countries offer at least two hours per week of PE in both primary and secondary schools. In Canada only 20% of parents reported that their child received daily PE. The majority of parents (41%) indicated that their child received PE one to two days per week whereas 10% of parents indicated that their child received no PE at all (Craig et al., 2001). Combined with this is the reduced amount of time devoted to school PE (Grantham, 1998; Thibault, 2000), the lack of mandatory PE throughout all grades in every province but Quebec (Luke, 2000), and significant declines for boys and especially girls in PE enrollment once it becomes an optional subject at the secondary level in many Canadian provinces (Deacon, 2001; Government of Newfoundland and Labrador, 1996; Spence, Mandigo, Poon, & Mummary, 2001).

Although school-based PE is meant to be where all children can receive equal and equitable opportunities to be physically active, many of the teachers expected to deliver these programs may not have the necessary training to be effective at causing a behavioral change (Hardman & Marshall, 2000b). As a result, the delivery of health-related PE curriculum by PE specialists who have received specialized training related to PE pedagogy has been recommended as an important vehicle for enhancing and increasing children's PE experiences (Grantham, 1998; USDHHS and US Department of Education [USDE], 2000; USDHHS, 1996; World Health Organization, 2000; Young, 1997). These recommendations stem from earlier research that demonstrates that PE specialists possess the content knowledge (Metzler, 2000) necessary to have a positive effect on school-based PE programs whereas many elementary generalists feel they lack the necessary training and education to implement provincial PE curriculum effectively.

For example, in their review of PE programs across the world, Hardman and Marshall (2000b) reported that "in many countries, the generalist teacher in primary schools is often inadequately or inappropriately prepared to teach physical education" (p. 218). This claim is backed up by two Canadian examples. In a review of the implementation of British Columbia's PE curriculum, Deacon (2001) reported that both elementary generalist teachers and secondary PE specialists cited lack of training and expertise as a major barrier for elementary generalists to achieve curriculum outcomes in PE. In Manitoba, Janzen et al. (2003) also cited lack of training or knowledge as a barrier reported by classroom teachers when teaching PE. Many elementary generalists who teach PE receive minimal training during their teacher preparation programs. This is compared with PE specialists who have either majored or minored in PE (often 3-5 years) prior to completing their bachelor of education degree or have received specialized and intense training during their preservice program.

This lack of teacher preparation and expertise in PE is often cited as one of the largest barriers to the delivery of quality daily PE (QDPE) in Canadian schools (Hansen, 1990; Tremblay, Pella, & Taylor, 1996). Robbins (1987), for example, reported that support for QDPE programs in Canada came primarily

from PE specialist teachers. A total of 93% of PE specialists supported the concept of QDPE compared with only 65% of generalist teachers and 63% of principals. The short-term and long-term effects of QDPE programs delivered by PE specialists have been documented earlier. For example, in a review of research results from the Trois-Rivières Growth and Development longitudinal study, Trudeau, Laurencelle, Tremblay, Rajic, and Shephard (1998) reported that students who received QDPE from PE specialists had higher levels of activity (especially on weekends), better physiological outcomes (e.g., aerobic power, muscular strength, endurance) and enhanced academic performance in some curricular subjects compared with students who received minimal PE from their homeroom teacher (i.e., non-PE specialist). In their follow-up to this study, Trudeau et al. reported that women who had received the QDPE program from PE specialists 20 years earlier were more likely to report positive indicators of health (e.g., being vigorously active, greater perceived level of health, fewer back problems) than women who received only one PE class per week delivered by their homeroom teacher.

Janzen et al. (2003) have also reported several benefits of having a designated PE specialist. In a three-year study at four Manitoba schools, they reported that PE specialists were more likely to deliver developmentally appropriate, inclusive, and gender-equitable lessons; take into consideration students' affective development in their classes; have increased variety of classroom and extracurricular activities; and have a positive effect on the overall school climate. In addition to lack of training and knowledge, non-PE specialists (i.e., homeroom teachers) cited planning issues pertaining to "lack of time to prepare lessons, problems with gym sharing, inadequate equipment, and no one having responsibility for the overall program" (p. 44) as challenges they had to negotiate on a regular basis.

In the US, a series of studies from San Diego State University have provided evidence of the effect that PE specialists and/or training generalists can have on program delivery and student learning. Sallis, McKenzie, Kolody, and Curtis (1996) reported data that suggested that superintendents identified teacher preparation and expertise as one of the most important factors for successfully implementing quality PE programs. Improvements made to lessons by reducing management time, modifying curricular content, and managing class sizes may be obtained with training and feedback to teachers based on observations of lessons (McKenzie, Marshall, Sallis, & Conway, 2000). Those trained in PE have been found to be more effective at enhancing the amount of time spent on vigorous physical activity during a class, and students in these classes demonstrate increased fitness scores compared with classes taught by untrained teachers (McKenzie et al., 1995; Sallis et al., 1997). In classes not taught by a specialist teacher or when the specialist teacher was removed from the class, a significant drop in moderate to vigorous activity time and skill development occurred. In addition to the benefits of being taught by a PE specialist, McKenzie et al. (1995) found that providing classroom teachers with preparation on how to implement PE curriculum can have a positive effect on enhancing students' motor skill development.

Unlike earlier studies, however, Graham, Metzler, and Webster (1991) did not find that PE specialists had a significant effect compared with non-PE

specialists. Based on a two-days-per-week (60 minutes total) PE program intervention with 168 elementary school students, those taught by PE specialists did not consistently report higher levels of motor skills, fitness, attitude, and cognitive measures over the three-year intervention period. However, concerns about the ability to cause change in an enhanced curriculum during only two PE classes per week were raised as a major limitation to this study. The authors argued that more time per week was needed to achieve the curricular objectives realistically and thus bring about behavioral changes.

The consensus from researchers, experts, and professional organizations suggests that PE classes taught by qualified instructors tend to have the greatest effect on student learning and program quality. Despite this support for PE specialists, only three Canadian provinces (Quebec, Prince Edward Island, and New Brunswick [francophone division]) have hiring policies for PE specialists at the elementary level. Although other factors contribute to the lack of hiring policies with respect to PE specialists (e.g., financial costs, political and administrative support), a contributing factor may be the small amount of documented evidence describing the characteristics of who is teaching PE in Canadian schools and the relationship between PE specialists and the characteristics of the programs they offer in their schools. To address the paucity of research in this area, the purpose of this study was to gain a deeper insight into how many PE specialists are teaching PE classes in Alberta schools and the relationship between having PE specialists teach and the variables associated with program delivery.

Method

Procedure

A representative sample of public schools in Alberta was obtained through a stratified systematic selection technique (Dyer, 1995). A list of all schools stratified by the 63 school zones was obtained from the provincial educational authority. In each school zone, after randomly selecting a start point on the list, every 10th school was selected. For school zones that had fewer than 10 schools, one school was selected at random. After we had received ethical approval, school board superintendents were asked if principals of the schools that had been randomly selected to participate in the study could be approached. Permission was granted to allow 407 school packages to be sent to principals across Alberta. Each package contained a cover letter, informed consent form, one principal questionnaire, and five teacher questionnaires.

As it was not possible to obtain a listing of teachers by schools, we were not able to develop a sample frame for teachers. Thus we used nonprobability sampling procedures (Dyer, 1995) to select teachers. Specifically, on receipt of the package the principal was asked to complete the principal questionnaire and to give questionnaires to up to five PE instructors in the school.

Research Instruments

The principal questionnaire contained open-ended, fill-in-the-blank, and Likert-type questions to gain information in the following categories: (a) description of school (number of students, total enrollment in PE, urban/rural); (b) adequacy of facilities (e.g., indoor facilities, equipment for PE program); (c) consideration of who teaches PE classes; (d) timetable information about PE classes (i.e., minutes in timetable devoted to PE at each grade level); (e) factors

influencing the school's PE program (e.g., expertise on staff, funding, preparation time for PE teachers); and (f) intramural and extramural program descriptions (i.e., type of activity, frequency, number of students involved). Only the results from the questions about staffing issues in PE (i.e., consideration of who teaches PE classes, expertise on staff) in the principal questionnaire are presented in this article.

The teacher questionnaire contained a mix of open-ended, fill-in-the-blank, and Likert-type questions to gain information about: (a) the teacher's background (sex, teaching experience, postsecondary teacher preparation); and (b) the factors that affect the delivery of PE program (i.e., factors related to program delivery, attitude toward teaching PE, class instruction).

The questionnaire was designed by the research team based on an extensive literature review of prior studies that collected relevant information about the PE curriculum at the time. Both the principal and teacher questionnaires contained modified questions pulled from several previously used questionnaires (Heath, Pratt, Warren, & Kann, 1993; Ross, Pate, Corbin, Delpy, & Gold, 1987; Sallis et al., 1996; Tremblay et al., 1996; Wood & Ferrand, 1997) to reflect the key categories under investigation for this study. Before we implemented the questionnaire, it was given to a small group of teachers who were asked for feedback on ease of administration and wording of the questions. Minor changes were made, and the survey was then sent out for completion.

Participants

A total of 169 principal questionnaires were returned (41.5% of total possible). Approximately 47% of the principal questionnaires were returned from rural settings, and the average school size indicated by the principals was 363 students (SD=262.82; Range = 4-1,670). Of all the elementary schools (Divisions I & II) involved in the sample, approximately 45% were urban and 55% were rural schools. Of all the junior high (Division III) and secondary schools (Division IV), approximately 43% were urban and 57% were rural schools. Division I includes grades 1 to 3, Division II includes grades 4 to 6, Division III includes grades 7 to 9, and Division IV includes grades 10 to 12.

A total of 480 (210 M, 269 F, 1 unknown) teacher questionnaires were returned. This represents approximately 23.6% of the total questionnaires sent out in the principal packages. This number is somewhat ambiguous because it was not known how many PE teachers actually received the questionnaire because they were delivered by the principal to a maximum of five teachers in each school. In some schools there may have been only one PE teacher and so the other four questionnaires were discarded. Therefore, it is not possible to provide an accurate return rate of how many teachers received the questionnaire and how many returned it. In total, these teachers taught 1,272 PE classes: 22% in Division I; 25% in Division II; 32% in Division III; and, 16% at Division IV classes. Another 4% of classes represented various mixes (e.g., mixed division classes).

Analyses

The data were analyzed at the principal (i.e., school), teacher, and class levels using SPSS 11.0. Descriptive analyses (e.g., means, standard deviations) were used to gain a better profile of who is teaching PE classes. A series of univariate

analyses (e.g., crosstabs, independent *t*-tests) were conducted to examine potential group differences based on PE specialists versus non-PE specialists. Where possible, differences between PE specialists and non-PE specialists in divisions at the class level were also performed. For the purposes of this study a PE specialist was a teacher who indicated that he or she had either a PE degree or had majored or minored in PE (or a related area such as coaching or recreation) during his or her university degree program (i.e., undergraduate, master's, and/or bachelor of education). These criteria were used to reflect the content knowledge needed to teach PE (Metzler, 2000). Due to the high number of *t*-test analyses conducted, a conservative *p* value of .01 was chosen to reduce the risk of making a type I error (Glass & Hopkins, 1996).

Because there are no standardized timetable rotations for Alberta schools, it is difficult to determine how many minutes per week are devoted to PE. For example, one school may have a six-day rotation where the timetable restarts after the completion of six days, whereas another school may have a five-day rotation. In Alberta the recommended amount of time for curricular subjects differs by division. In elementary schools (Divisions I & II) Alberta Learning recommends that 10% of curricular time be devoted to both health and PE combined. At the junior high (Division III) levels 75 hours of instructional time in PE is recommended, and at the secondary level (Division IV) students are required to take one course to fulfill graduation requirements. For the purposes of this study the proportion of the timetable devoted to PE was used as a measure of time spent in PE across all grade levels.

Results

Profile of Who Teaches PE in Alberta

Teachers had a mean of 11.7 (*SD*=8.44) years of teaching PE, with a range of one to 34 years. A total of 13.6% of teachers reported that they had a degree in PE (e.g., BPE) whereas 83.2% reported having an education degree (e.g., BEd). Thirty-nine percent of the teacher sample reported that they had a university degree where they majored in PE (e.g., Bachelor of Arts or Bachelor of Education with PE as subject specialization) whereas 8.1% reported that they had completed a PE minor with their degree. Of those who responded, 49% focused on elementary grades during university, 39% had a secondary focus, and 12% had a focus across all grades. Combined, approximately half (n=236) of the teachers were classified as PE specialists (137 M, 99 F) according to the definition of PE specialist for this article.

As Figure 1 demonstrates, a significantly ($\chi^2(2, 467)=76.09$, $p<.001$) greater proportion of women than men were teaching PE who had focused on elementary education during postsecondary teacher preparation and a greater proportion of men than women teaching PE at the secondary school level who had a secondary focus during their postsecondary degree. Also reported in Figure 1 was a significantly ($\chi^2(2, 469)=168.81$, $p<.001$) greater proportion of PE specialists teaching PE who had focused on secondary education and a significantly greater proportion of non-PE specialists teaching PE who focused on elementary education during their postsecondary education. A relatively small proportion of teachers identified as being trained in both elementary and secondary education.

At the school level of analysis principals were asked to rate four factors they considered when making decisions about who teaches PE classes on a four-

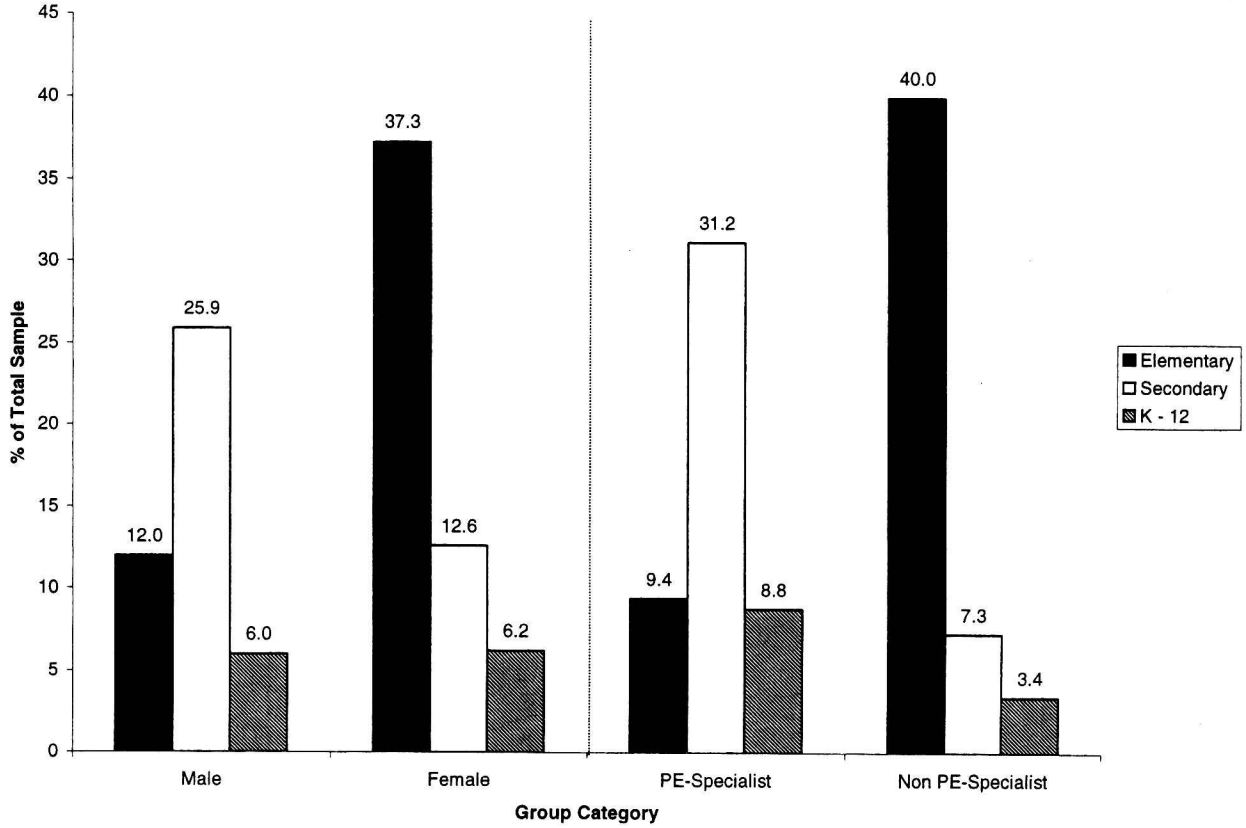

Figure 1. Sex and specialization of teachers by grade focus during university training program.

point Likert-type scale (1 most important consideration; 4 not taken into consideration). The most important consideration was whether the teacher had PE teacher preparation (e.g., specialist, major or minor, in PE) (M=1.39, SD=0.75) and the least important factor taken into consideration was teacher availability during a certain time slot (M=3.35, SD=0.82). Teacher interest (M=2.50, SD=0.87) and homeroom teacher teaches PE (M=2.66, SD= 1.16) were rated between the *often considered* and *least important consideration* range. As a result of this analysis, differences between PE specialists (those with PE training) and non-PE specialists are further examined with respect to the relationship between such training and variables associated with program delivery.

Relationship Between PE Specialists and Program Delivery

Factors related to program delivery. Items were provided that asked teachers to rate factors that influenced the delivery of their PE program. They were asked to rate a list of factors on a Likert-type scale from 1 (major negative effect) to 5 (major positive effect). Approximately 30% of teachers contended that the amount (or lack) of funding, preparation time available, and preparation time required for other subjects had a negative effect on their PE programs. Alternatively, a majority of teachers (+50%) felt that administrative support, availability of equipment and facilities, professional development opportunities, and their level of expertise had a positive effect on their PE program. Multiple t-tests were used to determine whether any of these factors differed by specialization. Significant main effects were found for two variables. Specifically, PE specialists reported higher means with respect to positive effect of professional development (PD) opportunities ($t(1,475) = 3.57$; $p<.001$) and personal perceived level of expertise or knowledge ($t(1,473)=11.62$; $p<.001$) compared with non-PE specialists.

Teachers' attitudes toward PE. Building on findings that PE specialists and non-PE specialists differed with respect to the positive effect of PD opportunities and level of expertise or knowledge, single item indicators were provided for teachers to rate their perceptions of being prepared to teach PE, their enjoyment for teaching PE, and their confidence for teaching PE on a five-point Likert-type scale (i.e., 1 not at all; 5 high). Although the use of single-item measures are not ideal (DeVillis, 1991), they were deemed necessary for the current survey due to the length of the questionnaire. As a result, the reader is instructed to interpret the mean results presented in Table 1 as indicators of teacher attitude rather than overall teaching efficacy. Independent t-tests were conducted to test for potential between-subject effects as a result of being a PE specialist. All three t-tests were significant at the $p<.001$ level. More specifically, PE specialists reported higher means for feeling prepared to teach PE ($t(1,477)=14.54$; $p<.001$), enjoying teaching PE ($t(1,478) = 8.58$; $p<.001$), and more confident in their ability to teach PE ($t(1,477)=13.98$; $p<.001$).

Class instruction. A total of 1,219 PE classes that could be categorized based on grade division were included in the sample. Classes consisting of mixed divisions (approximately 4% of the sample) were excluded from these analyses so that between-division differences could be explored. Of all these classes, 82.8% were co-ed and had an average class size of 26.7 students. Approximately 71% of these classes were taught by a PE specialist teacher. A significantly ($\chi^2(1,1218)=217.54$, $p<.001$) greater proportion of PE classes were taught by PE specialists in Divisions III and IV (grades 7-12) than in Divisions I

Table 1
Means and Standard Deviation Values for Teachers' Attitude Toward PE by Specialization

Item	*N*	*M*	*SD*
Confidence to teach PE			
PE specialist	236	3.61	0.97
Non-PE specialist	243	2.28	1.03
Enjoyment to teach PE			
PE specialist	236	4.48	0.64
Non-PE specialist	244	3.85	0.94
Prepared to teach PE			
PE specialist	236	4.65	0.57
Non-PE specialist	243	3.65	0.94

Note. Measured on Likert Scale of 1 = None/Low; 5 = High.

and II (grades K-6). Table 2 presents the number of classes taught by PE specialist and non-PE specialist teachers by division level.

For the total sample, 9.9% (SD=5.17) of the school timetable was devoted to PE. However, when semestered high school classes (15.9% of all classes) were excluded, approximately 8.6% (SD=3.50) of the total minutes in the school rotation were devoted to PE. This is almost identical to the average (M=8.6%; SD=4.04) provided by the principals on their questionnaire, and thus semestered schools were not included in future analyses examining percentage of time. Overall, a significant independent t-test ($t(1,979)=7.77$; $p<.001$) uncovered that as the percentage of the timetable devoted to PE increased, so did the likelihood that it would be taught by a PE specialist (M=9.18%; SD=3.78) compared with non-PE specialists (M=7.32%; SD=2.58). In each division the only significant ($p<.01$) relationship between classes taught by PE specialists and percentage of time devoted to PE classes was found at Division II (see Table 3). In this instance more time was devoted to PE in classes taught by PE specialists. In Divisions I and III, although the difference was not significant at

Table 2
Number of PE Classes Taught by PE specialist and Non-PE Specialist Teachers by Division Level

	Specialization		
Division (grades)	*PE Specialist*	*Non-PE Specialist*	*Total*
Division I (K-3)	140	154	285
Division II (4 - 6)	176	144	320
Division III (7 - 9)	370	38	408
Division IV (10 - 12)	185	21	206
Total	871	348	1,219

Table 3
Percentage of Time Devoted to PE Classes in the Timetable in Non-Semestered Schools by Teacher Specialization and Division

Division		*N (classes)*	*M (% time)*	*SD*	*t*	*P (2-tailed)*
I	PE specialist	118	7.69	2.99		
					2.03	.044
	Non-PE specialist	120	6.96	2.53		
II	PE specialist	163	7.90	3.49		
					2.95	.003*
	Non-PE specialist	124	6.92	1.53		
III	PE specialist	333	10.00	3.52		
					2.12	.035
	Non-PE specialist	35	8.72	1.75		
IV	PE specialist	40	11.63	4.35		
					−2.23	.031
	Non-PE specialist	3	18.25	11.68		

*$p<.01$.

the $p<.01$ level, the positive relationship between PE specialists and percentage of time devoted to PE remained. A statistical comparison at the secondary level (Division IV) was difficult to interpret as only three classes in nonsemestered classes were taught by a non-PE specialist.

Discussion

The results from the current study provide some of the initial representative descriptions of who is teaching PE in Alberta schools. Half of the teachers in this study were trained as PE specialists according to the definition of PE specialist used in this article and taught over 70% of the PE classes reported in this study. However, significant differences existed between elementary, junior high, and secondary schools. Most PE specialist teachers were men who taught at the junior high and secondary school level and reported teaching several classes of PE. The majority of non-PE specialist teachers were women who taught at the elementary school level and most reported teaching one or only a few PE classes. The underrepresentation of PE specialists at the elementary level is consistent with the situation in other provinces (Deacon, 2001; Government of Newfoundland and Labrador, 1996) and countries (Hardman & Marshall, 2000a). Earlier research has demonstrated that the elementary years are a critical time for developing positive physical skills, attitudes, and knowledge about physical activity (Gallahue & Ozmun, 1998). Given the documented evidence of the benefits of PE specialists on the development of these important skills during this critical period (McKenzie et al., 1995; McKenzie, Sallis, Kolody, & Faucette, 1997), one could argue that having PE specialists during these critical developmental years at the elementary level is vital for developing the skills, knowledge, attitudes, and health benefits for an active, healthy lifestyle.

Although further research is needed to investigate the long-term effects of PE specialists at the elementary level (e.g., will more students enroll in secondary PE when previously taught by an elementary PE specialists? Will students

be more active and display better health outcomes when taught by an elementary PE specialist?), these results do raise questions about the imbalance between elementary and secondary schools. This issue is even more important given the increased advocacy by health organizations for mandatory daily PE and the foundation that elementary PE provides for the development of the necessary skills to lead an active, healthy life. If such policy is implemented, it will be increasingly important to ensure that those delivering such programs have the necessary training to cause the behavioral and health changes that are associated with a quality PE program. The current study indicated that non-PE-specialists reported lower levels of confidence, enjoyment, preparation, and knowledge and fewer PD opportunities than PE specialists. To ensure that principals are able to find and hire qualified staff to deliver PE classes, it will also be important for Canadian universities to provide sufficient training opportunities for preservice student teachers at both the elementary and secondary levels. This is particularly important to help meet the growing demands (Walton, 2003) for quality, daily PE from kindergarten to grade 12 in provinces such as Alberta.

Those teachers defined as specialists in this study felt more prepared, confident, and enjoyed teaching PE more than non-PE specialists. PE specialists also indicated that their professional development opportunities and perceived level of expertise were major assets in allowing them to deliver their programs effectively. The lower level of perceived preparedness, confidence, and knowledge reported by the non-PE specialist is a trend that is found in many countries around the world (Hardman & Marshall, 2000a) and other Canadian provinces (Janzen et al., 2003). This may be a contributing factor to the majority of principals indicating that a teacher's background is their first priority when assigning subjects to teach. As a result, it is recommended that PE specialist teachers be considered first at both the elementary and secondary levels due to the potential benefit of having confident, prepared, and knowledgeable instructors.

Another potential benefit of having PE specialists teach PE is the quantity of organized PE students received. The current study revealed a significant relationship between percentage of time devoted to PE in the timetable and classes taught by PE specialists. This relationship existed overall throughout the data and across Divisions I to III. These data also suggest that elementary classes taught by PE specialists are more likely to meet Alberta Learning's recommendation of 10% of instructional time devoted to health and PE. The relationship at Division IV was difficult to interpret given the low number of PE classes in non-semestered schools taught by non-PE specialists. Although a directional relationship cannot be provided given the design of this study, it does provide some evidence for the benefit of having PE specialists teach PE and is consistent with earlier research. For example, Ross et al. (1987) and Sallis et al. (1997) reported data that showed that elementary school students received more PE per week when it was taught by a PE specialist than when it was taught by their homeroom teacher. McKenzie et al. (1997) also reported that classes taught by PE specialists were longer and that a significantly greater proportion of time was devoted to PE in the school's subject area rotation when taught by PE specialists. In addition, when the specialist left the school at the end of the

study, a significant reduction occurred in the number of lessons and minutes of PE per week.

Timetabling decisions are often made at the administrative level by the school principal and are often beyond the control of the teacher. Principals in the current study indicated that they considered teacher preparation in PE as an important factor in determining who would teach PE. Principals may be more inclined to devote more time in their schools to PE if it is taught by a specialist. This may be due to their comfort level to devote more time to a subject that has qualified staff and/or having an advocate in the school who will ask for sufficient time to be devoted to PE. It may also pertain to trying to coordinate several teachers for gym time and space as opposed to having one person (i.e., a PE specialist) overseeing the PE program and schedule (Janzen et al., 2003). Future research should address why there is a significant relationship between PE time and PE specialists and implement research designs capable of addressing causality. Perhaps principals need to become aware of the expertise of elementary PE specialist teachers and current hiring practices in particular as fewer specialist teachers were found teaching in the elementary grade levels in this study. Elementary PE specialist teachers have the knowledge, skills, and attributes to be classroom teachers and/or PE specialist teachers in a school. Future research could also examine the extent to which PE specialist teachers serve as mentors for generalist teachers in elementary schools.

Limitations and Future Research

Although schools were selected on a representative and random basis, teachers were selected by the principal to participate in this study. Thus the teachers may not be truly representative of all teachers instructing PE in the Alberta public school system. At the elementary level, for example, teachers from grades kindergarten to grade 6 may teach their own homeroom PE classes. This would mean that more than five teachers teach PE in one particular school. Thus the principal would decide or ask his or her staff to take part in the study. Teachers with a background in PE may be the first to be asked or volunteer to complete the questionnaire. Alternatively, schools with one PE teacher would return only one teacher questionnaire. This may help to explain why only 24% of the teacher questionnaires were returned. Researchers conducting future representative and random studies may wish to contact schools in advance to determine the number of teachers who actually teach PE and send out the appropriate number of questionnaires.

Another limitation to this study was the survey-type design that was used. Only descriptive analyses were possible, and a deeper understanding of *how* a PE specialist can be influential was not possible. Given this limitation, however, the current study does help to plant the seeds for future research designs to address the specific effects of PE specialists on their students' learning. For example, the data presented in this study demonstrated a relationship between students who have a PE specialist teacher and the amount of time in PE. Future research is needed, however, to address the quality of these classes directly and the effect (e.g., student learning, long term physical activity levels, skill development) they are having on students. Despite some initial evidence provided by Trudeau et al. (1998), the long-term effects of having specialists teach our students and the barriers (e.g., financial) faced by schools to hiring PE specialists is relatively unknown. Such research is crucial for advocating

evidence-based policies in governmental or school district and teacher education programs in order to educate students, parents, and the extended community about the significant benefits of adopting physically active, healthy lifestyles.

In Canada, and in many other countries, education is often mandated at provincial or state levels. As such, various policies may exist that affect the decisions determining who is or who should be teaching PE. Although the current study found similarities to other existing studies, researchers may wish to conduct their own representative study in their own state, province, or territory to compare the similarities and differences across PE teachers.

The results also indicate a significant gender difference in the number of PE specialists at elementary and secondary levels. The data suggest that more men at the junior high and secondary level are PE specialists, whereas the majority of female teachers are non-PE specialists teaching at the elementary level. The reasons for these gender differences were not addressed in this study and warrant further investigation. This could have a significant effect on preservice training programs that may wish to address why more women than men are choosing to teach at the elementary level, whereas fewer women are choosing to specialize in PE at the junior high and secondary levels (Boot & Browne, 1994). The lack of female role models at the secondary level may also be a contributing factor to the marginalization of girls in high school PE programs (Humbert, 1995) and their significantly reduced participation in PE when it becomes optional (Spence et al., 2001). Future research is thus warranted to investigate the effect that female PE specialists have as role models on young women's PE experiences.

Conclusion

Despite calls for mandatory, daily PE in Canadian schools, the documented benefits of having PE specialists teach these classes, and principals' preference for selecting teachers with PE training to teach PE, PE specialists are underrepresented in elementary PE classes. Although causal relationships could not be reported in this study, the results do help to fill some important gaps with respect to the potential benefits of having PE specialists in Alberta classes. Specifically, the data suggest that teachers classified as specialists tend to be more confident, feel better trained, enjoy teaching PE more and devote a larger proportion of the timetable to PE than in classes taught by non-PE specialists. Future research is needed in Canadian provinces to address the short-term and long-term effects that PE specialists have in the schools and the barriers faced by administrators to hiring PE specialists. Such research is needed to ensure that should policy-makers decide to heed calls for mandatory, daily PE across all grades, those who are asked to teach these classes have sufficient training, confidence, and skills to deliver quality programs.

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