

A Case Study of Preservice Physical Education Teachers' Attitudes toward and Perceived Barriers to Quality Physical Education

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Abstract

The purposes of this study were 1) to assess preservice physical education teacher's beliefs in the four domains representing important outcomes for physical education as identified and measured by Kulinna et al. (2010) along with nutrition as an additional domain and 2) to identify barriers to quality physical education given by PETE candidates and identify barriers by pertinent demographic characteristics. Eighty-six PETE candidates completed a demographics survey, the *PETE Students'/Physical Educator's Attitudes toward Curricular Outcomes in Physical Education* questionnaire and the *Perceived Barriers to the Delivery of Quality Physical Education* questionnaire. Participants' attitudes and priority of curricular outcomes in were similar to Kulinna et al. (2010). The newly included nutrition domain was ranked as the third priority for PE outcomes. Institution-related barriers were identified as preservice teachers' major barrier to quality physical education in K-12 schools. Also, gender had a significant effect on participants' perception of barriers for 14 of the 20 questionnaire items where female PETE students anticipate these barriers as having greater influence on their ability at provide quality physical education than male participants. Recommendations for PETE programs to assist at minimizing the main barriers to quality PE anticipated by preservice students are discussed.

Keywords: quality physical education, preservice students, attitudes, beliefs, barriers

1. Introduction

The No Child Left Behind (NCLB) Act of 2001 defines highly qualified teachers as those who "must have 1) a bachelors' degree, 2) full state certification or licensure, and 3) prove that they know each subject they teach" (U.S. Department of Education, 2004, p. 2). The NCLB Act stipulates that all teachers of core subjects are required to be highly qualified by the end of the 2005 – 2006 academic year. Furthermore, in order to continue receiving federal funding after the first year of a multi-year grant or contract, the NCLB Act Subpart 10 – Physical Education requires an annual report that "demonstrates that progress has been made toward meeting State standards for physical education" (U.S. Congress, 2002, p. 1842).

In accordance with the NCLB Act, the National Association for Sport and Physical Education (NASPE; 2007) stated "it is critical to have highly qualified physical education teachers delivering a standards-based curriculum that will assist children in adopting and maintaining healthy lifestyles" (p. 1). Furthermore, in its position statement, NASPE identified six main attributes associated with the designation of *highly qualified physical education teacher*. The organization asserts that a highly qualified physical educator is one who 1) possess the skills, knowledge, and values outlined in the NASPE national standards for physical education, 2) base their teaching on the national standards for K-12 physical education in order to provide students a foundation of skills and knowledge that can apply to many activities, 3) establish high expectations for learning within the psychomotor, cognitive, and affective domains, 4) view assessment as an integral component of the teaching-learning process, 5) demonstrate professionalism and ethical behavior in the learning environment through positive interactions with students, colleagues, administrators, and community members, and 6) engage in reflective practices. Thus, the criteria for the designation of highly qualified physical educators identified by NASPE, the recognized national professional organization that sets the standard for excellence in physical education, physical activity and sport in the U.S., clearly meet and exceeds that of federal law.

Napper-Owen, Marston, Van Volkinburg, Afeman and Brewer (2008) contend that highly qualified physical educators' competence to teach are developed within the traditional physical education teacher education (PETE) program and as a result of experiences derived from alternative professional training opportunities. Furthermore, while there may be many elements of defining the highly qualified physical

educator, all of these elements fall under three main categories – 1) pre-service preparation, 2) design and delivery of the physical education program, and 3) professional development. Napper-Owen and colleagues assert that their publication along with the NASPE 2007 position statement provide an invaluable resource for PETE candidates and PETE programs who strive for quality physical activity programs and experiences for children and adolescents.

With greater national and state focus on accountability, the need to assess the attitudes and beliefs of PETE candidates that would motivate them to achieve the status of *highly qualified* according to federal law and NASPE's criterion is warranted. Parjares (1992) holds that teachers have different belief systems regarding the relative importance of various goals for physical education. Further, teachers' beliefs influence their curricular and instructional decisions and ultimately students' learning. Ennis (1996) agrees that the nature of teachers' attitudes and values related to physical education affect their design and implementation of the curriculum and student learning. Therefore, it can be assumed that pre-service teachers who value their PETE preparation education are more likely to design, implement and maintain a standards-based curriculum that will assist children and adolescents at achieving and maintaining healthy, active lifestyles.

2. Beliefs toward Curricular Outcomes for Physical Education

Attitudes toward the PETE program curriculum may have a large impact on pre-service teachers' success (Lewis & Kinnunen, 2009). Because attitudes and beliefs often develop at an early age and may change due to situational contexts (Aicinena, 1991), PETE students' beliefs about physical education's purpose and intended outcomes for children and adolescents can be shaped by their perception of their teachers, institutional setting, pre-service contact with the professional field and curriculum. Kulinna, Brusseau, Ferry and Cothran (2010) concur it is critical to assess pre-service teachers' beliefs regarding sport and physical education as a means to restructure their knowledge base and beliefs systems to those that translate to appropriate instructional practices.

Kulinna et al.'s (2010) assessment of preservice physical education teachers' outcome priorities in four domains – (a) physical activity and fitness, (b) self-actualization, (c) motor skill development, and (d) social development. They found that preservice teachers reported physical activity and fitness as their top priority. Also, analyses between levels of preservice program showed freshman and sophomore teacher candidates rated physical activity and fitness, self-actualization and social development outcomes for physical education as having lower priority than seniors, post-bachelors and graduate students. While Kulinna and colleagues' four domains of physical education priorities coincide with NASPE's standards for physical education that have been adopted by most states in the U.S., the widespread childhood and adolescent obesity problem in the United States indicates nutrition education is an equivalent priority that could be addressed by physical educators.

The research literature is filling with reports showing the relationship of nutrition and physical activity on academic performance (e.g., Castelli, Hillman, Buck, & Erwin, 2007; Coe, Pivarnik, Womack, Reeves, & Malina, 2006; Edwards, Mauch, & Winkelman, 2011) and obesity prevention (e.g., Baskin, Zunker, Worley, Dial, & Kimbrough, 2009; Sharma, 2006; Slawta & DeNeui, 2010; Sothorn, 2004). For example, Edwards and colleagues (2011) found that a school curriculum and policy that mandated proactive nutrition and physical activity behaviors education had higher MAP math scores that were associated with nutrition, physical activity and fitness and higher MAP reading scores associated with nutrition and physical activity. Also, Slawta and DeNeui (2010) found that *Be a Fit Kid*, a fitness-emphasized physical activity and heart-healthy nutrition education program, significantly changed elementary students' fitness, body composition and nutrition knowledge in comparison to the control group. However, the majority of these studies implements and/or examines comprehensive intervention programs that are extracurricular to the regular school curriculum.

Hauser, Goldberg, Wilde, Bers, Ioannone, and Economos (2010) identified several after school nutrition education programs (e.g., Georgia FitKid and HEAT Club) that have been successful at improving students' fitness, body composition, nutrition knowledge and dietary habits. While Hauser and colleagues highlight that afterschool programs are desirable because they infringe little on already tight academic schedules and achievement requirements, it can be argued that childhood and adolescent obesity is one of the most significant public health threats today and its remedy should be incorporated into the regular school curriculum rather than as an extracurricular program accessible to a subsection of the students. In support of this suggestion, Sharma (2006) asserts that interventions that utilize existing teachers, mostly with additional training, seems to be the most feasible and practical approach.

Furthermore, research consistently identify nutrition knowledge, dietary behaviors and physical activity are at the core of reducing childhood obesity, however these studies continue to discuss and recommend a dualistic curriculum philosophy where nutrition is taught by health educators and physical activity is led by

physical educators. For example, Baskin et al.'s (2009) implementation of an obesity prevention program in a low-resource school applied a holistic intervention that included cafeteria staff, health educators, PE teachers, parents and the principal. Although they found the intervention was viewed positively by students and staff, Baskin et al.'s recommendations for future directions encouraged delegating nutrition education to health educators, limited physical education to maximizing opportunities for students to engage in physical activity and play, and suggested changing students' dietary behaviors by altering/limiting the food choices offered by the cafeteria staff. Arguably, physical education is a premier interdisciplinary educational opportunity for students to learn and reinforce nutrition concepts, observe the personal effects of facilitative and maladaptive dietary behaviors and integrate nutrition concepts into their application of PE content. Thus, preparing preservice physical educators to incorporate nutrition concepts in their curriculum design seems an appropriate addition to PETE programs. Therefore, a purpose of this study is to assess preservice physical education teacher's beliefs in the four domains representing important outcomes for physical education as identified and measured by Kulinna et al. (2010) along with nutrition as an additional domain, and to examine differences between participant characteristics. Findings between preservice teacher candidates (i.e., freshmen and sophomores) and PETE candidates completing student-teaching assignments (i.e., juniors and seniors) are expected to be similar to those of Kulinna and Silverman. However, no assumption for participants' attitude toward the inclusion of nutrition concepts into the PE curriculum is made for this study, but is treated as an exploratory variable to describe.

3. Barriers to High Quality Physical Education

While teachers' beliefs and values are intrinsic, personal barriers to achieving the status of a highly qualified teacher and informal conversations with physical educators consistently reveal extrinsic factors that dampen their motivation and ability to provide quality physical education in the K – 12 schools. Thus, a crucial element for providing quality physical activity programs is careful understanding of preservice teachers' barriers to the implementation of programs (Barroso, McCullum-Gomez, Hoelscher, Kelder, & Murray, 2005). Large class sizes, adapting curriculum to limited facilities and equipment, schedule interruptions, reduced resources and funding, and other external and institution-related factors have been identified as challenges and the greatest inhibitors to implementing exceptional physical education programs (Barroso et al., 2005; Hill & Brodin, 2004; McGaha & Lynn, 2000; Morgan & Hansen, 2008).

Morgan and Hansen (2008) evaluated 189 classroom teachers' perceptions of the impact of barriers to teaching physical education using a 9-item questionnaire. Institutional barriers were ranked more strongly as barriers to quality PE than teacher-related barriers (e.g., poor expertise, low teaching confidence). The order of institution-related barriers from strongest to least impacting were 1) lack of time, 2) lack of departmental assistance, 3) lack of money, 4) inadequate facilities and equipment, and 5) class size too large. Earlier, Barroso et al. (2005) found that 241 PE specialists in the U.S. also rank-ordered institution-related barriers similar to the participants in Morgan and Hansen's study conducted in Australia. Thus, the perceived influence of institution-related barriers on quality PE transcends borders.

According to the Theory of Planned Behavior (Ajzen, 1991), perceived behavioral control is a key determinant of behavior such as the intent and demonstration of criteria of highly qualified teachers. The perceived difficulty or ease of performing a behavior is strongly reflected in anticipated barriers (Morgan & Hansen, 2008). Therefore, exploring external or institutional-related barriers "may improve understanding of teachers' decisions and actions regarding appropriate physical education programs and inform teacher educators in designing meaningful learning experience in teacher training courses" (Morgan & Hansen, p. 507). Furthermore, identifying barriers to implementing quality programs that are outside the control of the physical educator may have important implications for appropriately targeting resources, support and interventions for teachers and schools. Therefore, a second purpose of this study is to assess preservice teacher's perceptions of barriers to providing quality physical education. Because there are few studies available describing current physical education specialists' barriers or PETE candidates' anticipated barriers to quality physical education no research hypothesis is made for this variable of the study. Instead, the purpose of this portion of the study is to identify barriers to quality physical education given by PETE candidates, identify barriers by pertinent demographic characteristics (e.g., gender, year in PETE program, preferred school level to teach, etc.), and provide recommendations for PETE programs to assist at minimizing the main barriers to quality PE anticipated by preservice students.

4. Methods

4.1 Participants

The participant sample included 86 sophomore ($n = 4$), junior ($n = 26$) and senior ($n = 56$) PETE candidates (58 males, 28 females) whose average age was 24.95 years ($SD = 6.18$). The majority of participants were enrolled in either the PETE methods courses ($n = 48$, 55.8%) or the prerequisite content courses (e.g., introduction to kinesiology, motor development, biomechanics; $n = 31$, 36.0%) with a few enrolled in student teaching courses ($n = 7$, 8.1%). Fifty-three participants (61.6%) desired to teach at the high school level (grades 9 – 12), 30 (34.9%) at the elementary or middle school level (grades K-8), and 3 (3.5%) participants had no preference of school level. The majority of participants' primary reason for pursuing the PE degree and teaching credential/certification was to teach physical education in a K-12 school ($n = 70$, 81.4%) and few to coach high school or youth sports ($n = 9$, 10.5%) or to secure a degree that would guarantee a job ($n = 7$, 8.1%).

4.2 Instruments

Participants completed a demographic surveys developed to gather basic personal information (e.g., age, sex, race), their status as teachers in preparation (e.g., level in school), preferred teaching setting (e.g., K-8 v. high school, public v. private school) and main reason for seeking the physical education degree and teaching credential/certification.

The PETE Students'/Physical Educators' Attitudes toward Curricular Outcomes in Physical Education (adopted from Kulinna & Silverman, 1999) is a 45-item questionnaire that assesses five domains of outcomes for physical education programs – (a) physical activity and fitness, (b) self-actualization, (c) motor skill development, (d) social development, and (e) nutrition. Each subscale contains nine items for its measurement using a 5-point Likert-scale in which participants select the number that best represents their beliefs about each item on a scale ranging from 1 = not important to 5 = very important. Each domain (or subscale) is scored by summing its nine items where scores can range from nine to 45. An overall belief systems score is the computed average of the five subscale scores. For this study, the internal reliabilities of the original four domains of the questionnaire were acceptable and comparable to Kulinna et al. (2010): physical activity and fitness $\alpha = .72$, self-actualization $\alpha = .82$, motor skill development $\alpha = .88$, and social development $\alpha = .80$. The nutrition subscale, created for this study, was found to hold high internal consistency, $\alpha = .90$.

The Perceived Barriers to the Delivery of Quality Physical Education questionnaire incorporates the items of three surveys (i.e., Barroso et al., 2005, Hill & Brodin, 2004, and Morgan & Hansen, 2008) that have been shown to be reliable instruments of measure. The questionnaire used for this study consists of 20 items (e.g., lack of money/financial resources, large class size, and inadequate facilities) delegated to four main factors (institution-, teacher-, PE standards-, and logistic-related barriers) that are responded to on a 6-point Likert-scale. Participants indicate the strength of each barrier on their ability to provide quality physical education on a scale ranging from 0 = not a barrier/does not inhibit to 5 = major barrier/strongly inhibits. The questionnaire is scored by computing each item's mean.

4.3 Procedures

Institutional Review Board (IRB) approval for the use of human subjects in research was secured for this study. Participants were recruited from the PETE prerequisite and program courses at a university in the southwest region of the United States. During class sessions, the PETE students were informed of the purposes of the study, potential costs and benefits and their rights as human participants in research. The rights of human participants in research and the University's guidelines for ethics in research were adhered to at all times. Data was analyzed using SPSS version 20 and includes descriptive statistics (e.g., means, standard deviations, frequencies, etc.) and inferential analyses (i.e., ANOVA, crosstabs) appropriate for responding to the purposes and hypotheses of the study. For the ANOVA analyses, eta squared (η^2) is reported to describe the proportion of variance associated with or accounted for by each of the main effects, interactions, and error in an ANOVA analysis (Tabachnick & Fidell, 2001).

5. Results

5.1 Beliefs toward Curricular Outcomes for Physical Education

The majority of PETE majors in the study ($\geq 79\%$) believe the five domains are either very important or extremely important to the K-12 physical education curriculum (see Table 1 for count and percent of responses). The inclusion of physical activity and fitness concepts in the PE curriculum was identified as the most important domain with 98.8% of participants selecting it as either very important ($n = 16$, 18.6%) or extremely important ($n = 69$, 80.2%). Self-actualization was the second most important domain. Interestingly, 47 participants (54.7%) believe nutrition is an extremely important domain to teach within the K-12 PE curriculum. Average scores (see Table 2) show the PETE students' order of priority of program outcomes for K-12 physical education were 1)

physical activity and fitness, 2) self-actualization, 3) nutrition, 4) social development, and 5) motor skill development.

Table 1. Count and Percent of PETE Candidates ($N = 86$) for the PE Program Outcome Goals

PE Program Outcome Domain	Not Important	Not Very Important	Somewhat Important	Very Important	Extremely Important
Motor Skill Development					
Count	0	3	15	40	28
% of Total	0.0%	3.5%	17.4%	46.5%	32.6%
Physical Activity & Fitness					
Count	0	0	1	16	69
% of Total	0.0%	0.0%	1.2%	18.6%	80.2%
Self-Actualization					
Count	0	0	3	19	64
% of Total	0.0%	0.0%	3.5%	22.1%	74.4%
Social Development					
Count	0	0	5	31	50
% of Total	0.0%	0.0%	5.8%	36.0%	58.1%
Nutrition					
Count	0	0	10	29	47
% of Total	0.0%	0.0%	11.6%	33.7%	54.7%

Table 2. Descriptive Statistics of PE Program Outcome Goals for the Current Study ($N = 86$) and Kulinna et al. (2010)

PE Program Outcome Domain	Current Study		Kulinna et al. (2010)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Physical Activity and Fitness	40.87	3.43	39.09	7.73
Self-Actualization	39.56	3.89	38.09	7.03
Nutrition	38.51	5.13	--	--
Social Development	37.73	4.15	36.68	6.87
Motor Skill Development	35.50	5.41	37.02	7.12

Note: Kulinna et al. (2010) did not include nutrition as a PE program goal.

One-way ANOVA analyses of the independent variables gender, desired school level to teach (K-8, high school, no preference), current year in college (sophomore, junior, senior) and PETE program status (currently completing initial/prerequisite courses, methods courses, student teaching) by the five domains of PE program outcomes (the dependent variables) were conducted to identify differences between the participants demographics. The only significant gender effect found was that females ($M = 40.18$, $SD = 4.51$) believe nutrition was more important to the K-12 PE curriculum than males ($M = 37.71$, $SD = 5.25$), $F(1, 84) = 4.58$, $p = .03$, $\omega^2 = .04$, $\eta^2 = .05$. The only effect of desired school level found was for motor skill development. That is,

PETE majors with no preference for school level to teach believed motor skill development was more important to the PE curriculum ($M = 43.00$, $SD = 2.00$) in comparison to those who desired to teach at the K-8 level ($M = 34.90$, $SD = 5.43$) and the high school level ($M = 35.42$, $SD = 5.27$), $F(2,83) = 3.24$, $p = .04$, $\omega^2 = .05$, $\eta^2 = .07$. No other significant differences in participants' attitudes toward the importance of content for the PE curriculum by demographic variables were found. Social development and motor skill development were the PETE students' lowest priorities.

5.2 Barriers to High Quality Physical Education

To best illustrate the PETE majors' perceptions of barriers to high quality physical education, their responses were transformed into three categories. Participants who responded 0 or 1 on the Likert-scale were categorized as believing the item was *not a barrier/did not inhibit*. Responses of 2, 3 or 4 on the scale were grouped to reflect a belief that the item was *somewhat a barrier/inhibitor*. Responses of 5 or 6 were categorized as an expression that the item is a *major barrier/strong inhibitor* to quality physical education. Table 3 illustrates the count and percent of participants selecting the strength of each barrier. To apply greater meaning of these results, items selected by 40% or more participants as a *major barrier/strong inhibitor* were flagged as primary concerns for the PETE program to address. Items selected as a *major barrier/strong inhibitor* by 30-39% of participants were considered secondary concerns to be addressed by the program.

PETE majors identified four barriers that would have a major impact on their ability to be a high quality physical education teacher and to provide an effective physical education program for their students. These barriers – low priority relative to other academic subjects, lack of principal or administrative support, lack of time/Crowded curriculum, and inadequate or lack of equipment and materials, should be considered a high priority and deliberately addressed within the PETE program curriculum to enhance preservice teachers' confidence and ability to manage these concerns. Barriers of secondary concern for the PETE program curriculum are lack of financial resources (money), large class sizes, inadequate or lack of facilities, lack of standard-based fitness skill lessons, and lack of departmental assistance.

Table 3. In Descending Order as a Major Barrier, PETE Majors' ($N = 86$) Indication of How Strongly the Barrier Item Affects Their Ability to be a High Quality PE Teacher and to Provide an Effective Physical Education Program for K-12 Students

Barrier	Major Barrier/ Strong Inhibitor		Somewhat a Barrier/ Inhibitor		Not a Barrier/ Does Not Inhibit	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
20. Low priority relative to other academic subjects**	39	45.3	41	47.7	6	7.0
13. Lack of principal or administrative support**	37	43.0	40	46.5	9	10.5
1. Lack of time/Crowded curriculum**	35	40.7	45	52.3	6	7.0
5. Inadequate or lack of equipment and materials**	35	40.7	40	46.5	10	11.6
3. Lack of financial resources (money)*	31	36.0	46	53.5	9	10.5
6. Large class sizes*	30	34.9	49	57.0	7	8.1
4. Inadequate or lack of facilities*	28	32.6	45	52.3	13	15.1
16. Lack of standard-based fitness skill lessons*	28	32.6	44	51.2	13	15.1
2. Lack of departmental assistance*	27	31.4	48	55.8	11	12.8
19. Insufficient number of physical education specialists	22	25.6	52	60.5	12	14.0
10. Classroom management – directing students' behavior	18	20.9	46	53.5	22	25.6
12. Liability concerns	17	19.8	49	57.0	20	23.3
17. Lack of standard-based assessment & grading materials	17	19.8	59	68.6	10	11.6
15. Lack of standard-based sport skills lessons	16	18.6	55	64.0	15	17.4
18. Use of class time for dressing out	15	17.4	51	59.3	20	23.3
8. Schedule interruptions	14	16.3	57	66.3	14	16.3
9. Classroom management – setting up the gym	14	16.3	37	43.0	35	40.7
14. Colleague relationships	14	16.3	51	59.3	21	24.4
11. Managing different levels of skill	13	15.1	54	62.8	19	22.1
7. Need to adapt/modify lessons for students' needs	9	10.5	53	61.6	24	27.9

** Item identified as a major barrier/strong inhibitor by $\geq 40\%$ of PETE majors (primary concern for PETE programs to address)

* Item identified as a major barrier/strong inhibitor by 30-39% of PETE majors (secondary concern for PETE programs to address)

One-way ANOVA analyses of the barrier items by gender, desired school level to teach, current year in college and PETE program status were conducted to identify differences within the participants' demographic variables. Neither desired grade teaching level or current year in college significantly differentiated participants' perception of barriers to quality PE. Participants enrolled in physical education methods courses rated "lack of principal or administrative support" as a greater barrier ($M = 4.19, SD = 1.61$) than students completing student teaching hours ($M = 2.43, SD = 2.23$), $F(2, 83) = 3.69, p = .03, \omega^2 = .19, \eta^2 = .08$. Gender had a significant effect on participants' perception of barriers for 14 of the 20 questionnaire items. Female students anticipate these 14 barriers as having greater influence on their ability to provide quality physical education than male participants (see Table 4 for descriptive and inferential statistics).

Table 4. One-way ANOVA of Gender's Influence on Participants' ($N = 86$) Perception of Barriers to Their Ability to be a High Quality PE Teacher and to Provide an Effective Physical Education Program for K-12 Students

Barrier Questionnaire Item	Females		Males		F	p	η^2
	M	SD	M	SD			
1. Lack of time/Crowded curriculum	4.53	1.10	3.70	1.56	6.63*	.01	.07
2. Lack of departmental assistance	4.07	1.39	3.44	1.79	3.56	.06	.04
3. Lack of financial resources (money)	4.11	1.45	3.72	1.70	1.05	.31	.01
4. Inadequate or lack of facilities	4.32	1.44	3.14	1.77	9.45*	.00	.10
5. Inadequate or lack of equipment and materials	4.29	1.27	3.34	1.83	5.98*	.02	.07
6. Large class sizes	4.54	1.35	3.33	1.63	11.59*	.00	.12
7. Need to adapt/modify lessons for students' needs	2.82	1.59	2.36	1.63	1.53	.22	.02
8. Schedule interruptions	3.71	1.27	2.74	1.61	7.89*	.01	.09
9. Classroom management – setting up the gym	2.75	1.84	1.93	1.88	3.61	.06	.04
10. Classroom management – directing students' behavior	3.54	1.69	2.60	1.88	4.94*	.03	.06
11. Managing different levels of skill	3.46	1.69	2.60	1.63	5.14*	.03	.06
12. Liability concerns	3.86	1.53	2.34	1.64	16.75*	.00	.17
13. Lack of principal or administrative support	4.54	0.96	3.67	1.84	8.16* [†]	.01	.06
14. Colleague relationships	3.43	1.50	2.50	1.73	5.91*	.02	.07
15. Lack of standard-based sport skills lessons	3.89	1.20	2.57	1.70	17.38* [†]	.00	.14
16. Lack of standard-based fitness skill lessons	4.44	1.28	2.97	1.83	18.50* [†]	.00	.15
17. Lack of standard-based assessment & grading materials	3.86	1.27	3.03	1.59	5.73*	.02	.06
18. Use of class time for dressing out	3.25	1.84	2.66	1.66	2.26	.14	.03
19. Insufficient number of physical education specialists	3.82	1.49	3.28	1.69	2.11	.15	.02
20. Low priority relative to other academic subjects	4.93	1.12	3.79	1.69	13.68* [†]	.00	.11

* Significant at $p < .05$

[†] Homogeneity of variance not assumed, therefore Welch's robust test of equality of means statistic reported instead of the ANOVA F -ratio to avoid Type I error.

Note: Eta squared (η^2) describes the proportion of variance associated with or accounted for by each of the main effects, interactions, and error in an ANOVA analysis (Tabachnick & Fidell, 2001).

6. Discussion

Like Kulinna et al. (2010), the preservice students in this study ranked *physical activity and fitness* as the most important PE program outcome. While Kulinna and colleagues found social development to be the lowest program priority, the PETE students in this study ranked motor skill development lowest. Nutrition outcomes, a new factor measured in this study, were ranked third. Thus, the preservice teachers' beliefs regarding the priorities for K-12 physical education are consistent with the recommendations by national organizations (e.g., NASPE, CDC) and scholars for addressing childhood and adolescent obesity in the U.S. PETE programs that place a high emphasis on fitness concepts and interdisciplinary pedagogical methods across its curriculum are likely to strongly influence its students' educational priorities to be similar. Also, the fitness and obesity demographics of children, adolescents and adults in their local region and state may influence preservice students' priorities. For example, PETE programs located in regions with high rates of overweight and obese populations are likely to be more cognizant of the adverse health effects of obesity and adopt a teaching philosophy directed at lifelong physical activity, fitness and healthy nutrition habits.

However, finding motor skill development as the participants' lowest priority is somewhat problematic, especially for elementary and middle school physical education. According to the Theory of Planned Behavior (Ajzen, 1991; Ajzen & Madden, 1986), perceived behavioral control is a direct determinant of behavior and an indirect determinant through its influence on intentions. Furthermore, Rink (2006) insists that the number one criterion for K-12 physical education is that the learning experience should have the potential to improve the motor performance/activity skills of the students. Because the overarching outcome of K-12 physical education is to create lifelong physically active individuals, motor skill acquisition that allows individuals to effectively engage in a variety of physical and fitness activities remains imperative. Therefore, it is recommended that PETE programs deliberately and obviously incorporate motor skill development content into its courses across the curriculum and formally assess preservice students' pedagogical ability and methods in this domain.

Barroso et al. (2005) and Morgan and Hansen (2008) used relatively short questionnaires to assess perceived barriers to quality physical education; 8- and 9-items respectively. While Barroso and colleagues focused mainly on institution-related barriers, Morgan and Hansen assessed institution- and teacher-related barriers. The current study utilized a 20-item instrument examining institution-, teacher-, PE standards- and logistic-related barriers. Like previous studies of incumbent teachers, PETE candidates in this study anticipate institution-related concerns to be the major barriers/strong inhibitors on their ability to provide quality PE in K-12 schools. Logistic-related barriers (e.g., directing student behavior, setting up the gym, use of class time for dressing out) were not identified as major barriers and ranked lowest by the preservice teachers in this study, thus indicating this content is sufficiently taught in their PETE program. The only standard-based barrier of major concern for the study's participants was lack of standards-based fitness skill lessons. Also, a significant gender effect was found where female PETE students perceived a majority of the barriers as more threatening to their ability to provide quality physical education than their male counterparts.

PETE programs can do several things to minimize their students' perception of barriers to quality PE. First, PETE faculty should collaborate with their local K-12 schools and districts to seek and secure local, state, national and private funding to address institution-related barriers related to lack of financial resources, inadequate or lack of equipment and inadequate or lack of facilities. PETE faculty should also teach preservice students how to identify and apply for external resources available through national physical education organizations such as the American Alliance of Health, Physical Education, Recreation and Dance (AAHPERD) and its affiliates (e.g., NASPE and state HPERD organizations). Early exposure to external resources may improve PETE students' confidence to proactively address perceived barriers. Second, PETE programs should prepare students to develop proactive relationships with school personnel such as the principal, maintenance engineers, and teachers of other subject matters. Emphasis on these relationships should be aimed at improving the value of physical education across the school's curriculum, developing interdisciplinary assignments that benefit and advance K-12 students' competence in other subjects, and garnering and maintaining facilities and equipment to provide a variety of physical activity and fitness learning experiences to students. Third, develop preservice students' classroom management skills to improve and develop their confidence to minimize the effect of barriers to quality PE; a recommendation cited throughout the literature (e.g., Baskin et al., 2009; Chepyator-Thomson & Liu, 2003; Hill & Brodin, 2004; Sharma, 2006). Next, incorporate standard-based fitness teaching methods, and perhaps existing curriculums such as NASPE's Physical Best (PB), into the analysis and application courses. For example, Physical Best is a comprehensive health-related fitness education program developed for physical educators that focuses on 1) educating *all* children regardless of athletic talent, physical and mental abilities or disabilities, 2) moving students from dependence to independence for their own fitness and health, and 3) promoting regular, enjoyable physical activity (NASPE, nd). PETE faculty who hold NASPE Physical Best Instructor status could incorporate the PB curriculum within their fitness concepts course and offer

their students the opportunity to gain PB Specialist certification at the end of the course. In addition to improving students' ability and confidence to provide standards-based fitness skill lessons, they may include a nationally recognized certificate to their teaching portfolio that enhances their opportunity to secure employment. Finally, particular attention should be focused at developing female PETE students' ability to effectively negotiate barriers.

7. Future Directions

This study was delimited to PETE students at a single institution; however its results reflected the findings of previous studies with broader samples. Furthermore, this study used a survey of barriers that included more items than used in previous studies. Also, PETE program curriculums are dynamic across institutions and change over time. Therefore, it is recommended that there be continuous assessment of preservice students' attitudes and beliefs about the variables in this study. Second, Kulinna and Silverman (2000) assessed incumbent physical education teachers' outcome priorities in the four PE domains and Kulinna et al. (2010) examined PETE students on the same variables, however no known study examines both populations in a single study where between group contrasts are conducted. Thus, future research studies should concurrently assess and compare preservice and current physical education teacher's beliefs in the four domains (with the addition of the nutrition domain) representing important outcomes for physical education as identified and measured by Kulinna et al. (2010). Finally, the participants in this study prioritized the nutrition domain as the third highest PE program outcome. Furthermore, nutrition education accompanied with physical education has been identified as effective intervention to reduce childhood and adolescent obesity in the U.S. However, many of these programs are delivered after school as extracurricular opportunities and few programs are incorporated into schools' master curriculum. To maximize K-12 students' exposure to nutrition education, PETE programs should include a nutrition course for its students that 1) improves their ability to teach nutrition concepts within their physical education units and lessons, 2) emphasizes interdisciplinary pedagogical methods to involve other subject matters in the K-12 setting (e.g., science and math to analyze METs and calories, health to understand effect of food options on health, wellness and fitness, geography to learn about locally-grown foods in their region, etc.), and 3) are aimed at grades 3 – 6 and high school, a time when children are cognitively ready to learn about the importance of adopting healthy nutrition behaviors and adolescents exert their independence from parental control and explore options without adult guidance.

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