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Original Article

Physical Education students' beliefs in four important curricular outcomes: Results from three Greek Faculties

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Abstract
Purpose: This study aimed to investigate Physical Education (PE) students' belief systems toward the four important curricula outcomes goals (physical activity and fitness, self-actualization, motor skill development and social development) and to compare these beliefs according to gender and undergraduate Faculty program attended.
Method: 690 Students from the three major PE Faculties in Greece were enrolled (465 males, 225 females). They completed a previously validated four-factor belief systems instrument.
Results: Internal consistency reliability for the instrument was .915. A confirmatory factor analysis demonstrated a good fit of the current sample to the hypothesized four-factor outcomes model. The students did not view the outcome goals as equally important. The prevailing goal was physical activity and fitness, followed by self-actualization. Multivariate analysis of variance results for comparisons between sub-groups revealed significant differences between genders and undergraduate programs attended.
Discussion/Conclusion: The findings, coupled with those of previous researches, imply that PE students form their beliefs mostly based on their previous experiences. These beliefs appear to be very solid and thus, undergraduate studies seem to have a small effect on their formation and modification.
Key Words: undergraduate program, educational goals, physical activity, gender differences, PETE.

Introduction

Most national Physical Education (PE) curriculums worldwide are based on a variety of outcome goals, with the majority of these oriented towards teaching motor skill abilities and increasing students' physical activity and fitness levels. SHAPE America (2014) has highlighted five important national standards to be achieved. In order someone to become a physically literate individual, he/she should: 1. Demonstrate competency in a variety of motor skills and movement patterns; 2. Apply knowledge of concepts, principles, strategies and tactics related to movement and performance. 3. Demonstrate the knowledge and skills to achieve and maintain a health-enhancing level of physical activity and fitness; 4. Exhibit responsible personal and social behavior that respects self and others; 5. Recognize the value of physical activity for health, enjoyment, challenge, self-expression and/or social interaction (SHAPE America, 2014). These standards are widely accepted and have been used as the basis for Greek PE learning standards (Ministry of Education, Research and Religious Affairs [MERRA], 2011).

The Greek PE curriculum, which has recently changed and is mentioned as PE Cross-thematic curriculum (MERRA, 2011), is widely based on SHAPE's established standards (2014). However, the degree to which national standards are incorporated in PE seems to be limited (Holly, Clark, Pennington, & Altana, 2003). Pre-service PE majors have difficulty in identifying educational standards, especially those related to the affective domain, which may signal a superficial understanding of the national curriculum (Kniffin, Foley, MacDonald, & Howarth, 2014). Capturing students' beliefs regarding curricular outcome goals will provide a useful insight to the process of identifying and understanding their decisions and actions (Pajares, 1992).

Corresponding to the MERRA (2011) classification, Kulinna and Silverman (1999, 2000) had previously created an instrument in order to measure PE students' and teachers' beliefs regarding the curricular outcome goals. They assessed four important outcome priorities: 1. Physical activity leading to fitness, which focuses on the importance of promoting physical activity participation leading to improved fitness levels and, consequently, health; 2. Self-actualization (cognitive-emotional) that emphasizes personal growth, such as self-esteem, self-confidence, enjoyment and self-efficacy for participation in physical activities; 3. Motor skill development, which directs effort on acquiring prerequisite motor skills needed for successful participation in many activities and sports; and 4. Social development, centred on developing social skills, awareness, concerns and behaviours, as well as an appreciation for and an acceptance among all students. Xiang, Lowy and

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McBride's (2002) study revealed that the beliefs regarding these purposes of elementary PE are the most common among PE professionals and are consistent with those espoused in PE textbooks.

With regard to the desired curricular outcome goals, the majority of studies have shown that PE teachers and students believe that all outcome goals were important (Adamakis et al., 2013; Adamakis & Zounhia, 2015; Guan, McBride, & Xiang, 2005; Kulinna, Brusseau, Ferry, & Cothran, 2010; Kulinna & Silverman, 2000; Tsangaridou, 2008; Wang & Koh, 2006). Older studies have concluded that the primary outcome goal was motor skill development (Placek et al., 1995; Xiang, Lowy, & McBride, 2002) and this was more obvious in the elementary education setting (Matanin & Kollier, 2003). More recent studies, later than 2000, have found that physical activity and fitness that leads to the health enhancement were the most important PE outcomes (Adamakis et al., 2013; Adamakis & Zounhia, 2015; Kulinna et al., 2010; Matanin & Kollier, 2003; Wang & Koh, 2006), probably due to a rise in the fitness orientation approach (Richards & Padaruth, 2017). The self-actualization goal was considered an important one, especially in eastern countries (Guan, McBride, & Xiang, 2005; Wang & Koh, 2006; Xiang, Lowy, & McBride, 2002), because societal trends in these countries emphasize a harmonious development of the whole human's personality. In Greece it was considered the second prevailing outcome goal, following physical activity and fitness goal (Adamakis et al., 2013; Adamakis & Zounhia, 2015).

Gender differences in these belief systems, in general, did not exist (Guan, McBride, & Xiang, 2005; Kulinna & Silverman, 2000; Placek et al., 1995). However, Alshammari (2004) found that in his social context significant differences existed between men and women, which could be related to the nature of the PE culture in Kuwait and people's needs. These gender differences were also apparent in the Greek setting, which was attributed to the women's socialization roles, which drive them to more easily accept and perform emotional and expressive roles, while men believe they should have more active ones (Adamakis et al., 2013).

In addition to potential differences by gender, this study also focused in potential students' belief systems differences by Faculty program attended. Ennis and Chen (1995), during their work with value orientations, suggested that context, which was related to geographical region, influenced teachers' curricular priorities. Regarding the belief systems toward curricular outcome goals, only one previous research has been published (Kulinna et al., 2010). However, in this approach, there was no clear trend in regional differences and this was attributed to the unbalanced participant numbers by region, since participants came from 18 universities, with participation ranging from 1 to 67 students per university. Clearly, further work is needed in this specific area. Thus, the purpose of the present study was to examine PE students' belief systems and classification of four important curricular outcome goals. Additional research questions focused on whether there were differences in their belief systems by gender or Greek Faculty of PE and Sport attended.

Material & methods

Participants

A proportional quota sampling was used to capture the students' ratio of each Faculty. The participants in the present study were in total 690 PE students from three major (five in total) PE Faculties of Greece, namely Athens,[1] Thessaloniki[2] and Komotini.[3] They were 465 males and 225 females, with an average age of 21.11±2.18 years and extensive athletic experience of 11.27±4.43 years. More information regarding the participants, divided according to Faculty, can be found in Table 1. All students were informed about the purpose of this study, provided informed consent and it was made clear that participation was voluntary, anonymous and confidential.

Table 1. Demographic characteristics of the sample according to PE Faculty

	Group	Athens	Thessaloniki	Komotini
N		320	229	141
Age (years)		20.97±2.65	21.02±1.82	21.57±1.34
Athletic experience (years)		11.70±4.52	11.64±4.01	9.70±4.54
Gender	Male	187 (58.4%)	178 (77.7%)	100 (67.4%)
	Female	133 (41.6%)	51 (22.3%)	41 (32.6%)
Athletic level	Non-elite athletes	159 (49.7%)	114 (49.8%)	94 (66.7%)
	Pre-elite athletes	102 (31.9%)	85 (37.1%)	41 (29.1%)
	Elite competitors	59 (18.4%)	30 (13.1%)	6 (4.3%)

Instrument

The instrument used (Beliefs toward curriculum in PE; Adamakis et al., 2013) was designed to measure PE students' belief system related to four important PE curricular outcomes. It has been previously validated in other contexts worldwide (Guan, McBride, & Xiang, 2005; Kulinna & Silverman, 1999; Kulinna et al., 2010).

[1] National and Kapodistrian University of Athens
[2] Aristotle University of Thessaloniki
[3] Democritus University of Thrace

The Greek version used for the present study contained 36 items, nine of each on four domains representing important outcomes for school PE programs: (a) physical activity and fitness; (b) self-actualization; (c) motor skill development; and (d) social development (Adamakis et al., 2013). A five-point Likert-type scale was used, with 1=Not important to 5=Extremely important. The responses from each domain were summed in order to create cumulative scores for every factor, according to the original authors' guidelines (Kulinna & Silverman, 1999; Kulinna et al., 2010).

The questionnaire has undergone two validation studies with a Greek sample. In the preliminary study, the instrument was translated by five PE experts. The content validity was very high; the mean percentage of agreement of the experts on all items was .96 and it was easily comprehensible by students. The test-retest reliability over time revealed a high percentage of agreement, with the Pearson *r* coefficients ranging from .82 to .85 ($p<.001$) and the intraclass correlation coefficients ranging from .90 to .92 for the four factors of the instrument (Adamakis et al., 2012). The main validation study conducted by Adamakis and colleagues (2013) with the use of confirmatory factor analysis (CFA) and a maximum likelihood structural equation modelling procedure supported the four-factor dependent model, as proposed by previous researchers (Kulinna & Silverman, 1999). All CFA fit indices ranged from slightly lower than optimal to very good (CFI=.93, NNFI=.93, IFI=.93, RMSEA=.069, 90% RMSEA=.065-.072). Furthermore, the internal consistency indices were acceptable, with Cronbach α coefficients ranging from .75 to .81 for the four factors.

Data analysis

The statistical analysis was conducted with the use of the statistical package IBM SPSS version 21.0 (IBM SPSS Corp., Armonk, NY, USA). Before analysis, variables were screened for accuracy of data entry, missing values, distribution (skewness and kurtosis), and potential outliers through descriptive statistics and Mahalanobis distance values. No missing values or outliers were observed, so the data was considered to be univariate and multivariate normal. Initially, a confirmatory factor analysis (CFA) was conducted with the entire sample to confirm instrument validity and appropriateness for use in the current research. CFA was performed using maximum likelihood structural equation modelling procedures, with IBM SPSS AMOS version 21.0, to determine whether the preservice teacher data fit the four measurement model. Maximum likelihood procedure is the most widely method used, is used when data show multivariate normality, and, additionally, is resistant to small deviations of the data from the normal distribution (Mîndrilă, 2010; Savalei, 2008). The internal consistency of the various constructs was assessed by Cronbach *a* coefficients, which had to be over .70 in order to be acceptable (Houser, 2008).

Data were analysed using descriptive (mean, standard deviation) and inferential statistics [multivariate analysis of variance (MANOVA) and profile analysis]. The independent variables for the two performed MANOVA were (a) *gender* and (b) *Faculty*, on the four factors of the PE outcomes questionnaire. In order to control whether the design was unbalanced, the equality of covariance matrices using Box's M test was used. Furthermore, the partial η^2 was presented as a measure of effect size for *F*-Tests. A partial η^2 value between .01 and .06 was associated with a small effect, between .06 and .14 with a medium effect, and .14 or greater with a large effect (Warner, 2012). For purposes of interpretation, significant multivariate effects were followed by a descriptive discriminant analysis (DDA) and univariate F-ratios [analysis of variance (ANOVA)] with Tukey's follow-up comparisons, as recommended by Tabachnick and Fidell (2007). In order the DDA structural coefficients to be considered important, they had to be over >.30 (Burns & Burns, 2009). Furthermore, a *profile analysis* was run using repeated measures ANOVA (RM-ANOVA) for the four outcome goals, followed by post-hoc Bonferonni correction to control all possible comparisons, in order to determine if the PE students considered each goal to be equally important (Tabachnick & Fidel, 2007).

Results

Results of the CFA demonstrated an adequate fit for PE students (N=690) to the four-domain model. All of the standardized factor loadings resulted adequate, ranging from .36 to .83. The comparative fit index (CFI) demonstrated an adequate fit for research purposes (CFI=.841), along with the chi-squared/degrees of freedom (χ^2/df=2.895). The Root Mean Square Residual (RMR=.036) and the Root Mean Square Error of Approximate [RMSEA=.052, 90% confidence interval (CI) ranging from .050 to .055] demonstrated a very good fit to the data of the present sample. The internal consistency reliability for the overall instrument was Cronbach a=.915, and for each outcome separately: (a) physical activity and fitness a=.793; (b) self-actualization a=.773; (c) motor skill development a=.791; and (d) social development a=.804.

All descriptive statistics of the four sub-scales are reported in Table 2. The RM-ANOVA profile analysis, with Greenhouse-Geisser correction due to violations of sphericity (Mauchly's W=.82, $p<.001$), was significant [$F(3,1850)=109.57$, $p<.001$] with a large effect size (partial η^2=.14), suggesting that PE students did not view the four outcome goals as equally important. The post-hoc analysis, using the Bonferonni correction in order to control all possible comparisons, showed that physical activity and fitness was the leading outcome goal, differing statistically significant from the three other goals ($p<.001$). The outcome of self-actualization followed as the second most important goal, differing statistically significantly from the two remaining goals ($p<.001$) followed by social development and motor skill development ($p<.001$).

Table 2. Descriptive statistics by outcome goal priorities

	Range	Mean	Standard deviation	Minimum	Maximum
Physical activity / fitness	9 - 45	36.88	4.37	20	45
Self-actualization	9 - 45	35.60	4.27	19	45
Motor skill development	9 - 45	34.12	4.39	19	45
Social development	9 - 45	35.03	4.60	20	45

The Box-M test of equality of covariance for the first MANOVA for the gender independent variable on the four outcomes was not statistically significant at (Box's M=6.99, p=.731) and the normality assumption was assumed. The MANOVA indicated that statistically significant differences were observed between males and females on the four important outcome goals [Hotelling's T=.05, $F(4,685)$=9.16, p<.001, η^2=.05]. The MANOVA was followed up with a discriminant function analysis, which significantly differentiated males and females [Λ=.95, $\chi^2(4)$=35.75, p<.001], explaining the 100% of the total variance. Structural coefficients associated with the significant discriminant function are displayed in Table 3. All of the structural coefficients related to gender differences were large enough to be considered meaningful (>.30). As observed in Table 3, follow-up ANOVAs on the separate outcomes' scores for the gender variable revealed significant differences for all curricular outcomes, with females having stronger beliefs than males (p<.001).

Table 3. MANOVA and DDA results for *Gender*

Goals	Year in university (n)	M	SD	Univariate F	p	partial η^2	DDA coefficients
Physical activity / fitness	Male (462) Female (225)	36.34 38.00	4.36 4.19	22.29	<.001	.03	.78*
Self-actualization	Male Female	35.07 36.70	4.30 4.00	22.79	<.001	.03	.79*
Motor skill development	Male Female	33.52 35.36	4.31 4.32	27.55	<.001	.04	.87*
Social development	Male Female	34.46 36.20	4.64 4.30	22.50	<.001	.03	.78*

*Significant >.30

The Box-M test of equality of covariance for the second MANOVA for the Faculty independent variable on the four outcomes was not statistically significant at (Box's M=26.60, p=.155) and the normality assumption was assumed. The MANOVA indicated that statistically significant differences were observed between students from different Faculties on the four important outcome goals [Wilks' Λ=.93, $F(8,1368)$=6,50, p<.001, η^2=.04].

The MANOVA was followed up with a discriminant function analysis, which significantly differentiated students from different Faculties, providing two statistically significant solutions. The first solution [Λ=.93, $\chi^2(8)$=51.17, p<.001] explained 76.3% of the total variance and the second one [Λ=.98, $\chi^2(3)$=12.33, p=.006] explained the remaining 23.7% of the total variance. Structural coefficients associated with the significant discriminant function are displayed in Table 4. All of the structural coefficients related to Faculty differences, apart from the motor skill development coefficient, were large enough to be considered meaningful (>.30). As observed in Table 4, follow-up ANOVAs on the separate outcomes' scores for the Faculty variable revealed significant differences for physical activity and fitness, self-actualization and social development, with the exception of motor skill development. The Tukey follow-up tests suggested that Athens students had stronger beliefs than Komotini students in physical activity and fitness (p=.021) and self-actualization goals (p<.001). Furthermore, Thessaloniki students had significantly higher priority in the self-actualization goal than Komotini students (p=.003), while the same trend appeared in the social development goal (p=.004).

Table 4. MANOVA and DDA results for the *Faculty*

Goals	Faculty (n)	M	SD	Univariate F	p	partial η^2	DDA coefficients 1	DDA coefficients 2
Physical activity / fitness	Athens (320) Thessaloniki (229) Komotini (141)	37.27 36.83 36.09	4.31 4.48 4.25	3.62	.027	.10	.43*	-.04
Self-actualization	Athens Thessaloniki Komotini	36.01 35.82 34.32	4.24 4.37 3.93	8.28	<.001	.02	.62*	.32
Motor skill development	Athens Thessaloniki Komotini	33.89 34.21 34.12	4.19 4.64 4.44	.93	.394	.00	-.21	.09
Social development	Athens Thessaloniki Komotini	34.90 35.74 34.17	4.48 4.85 4.29	5.42	.005	.02	.23	.84*

*Significant >.30

Discussion

The purpose of the present study was to examine PE students' belief system profiles, whether they had the same relative outcome priorities for PE. In addition, possible differences in the belief system of undergraduate students regarding four PE curricular outcome goals were investigated. More specifically, the study focused on differences in outcome priorities by gender and undergraduate Faculty program attended.

This study extended the findings of two previous research approaches (Adamakis et al., 2013; Kulinna et al., 2010) in a more systematic way. Initially the current results suggest that PE students from the three Faculties identified the physical activity and fitness goal as the most important one, followed by self-actualization, social development and, lastly, motor skill development. Although they held strong beliefs for all domains, statistically significant differences were observed, suggesting that they did not consider them equally important. These results are in complete accordance with previous researches in Greece (Adamakis & Zounhia, 2013, 2016; Adamakis et al., 2013) and match partially those of Kulinna and colleagues' (2010), especially in the two priority goals, physical activity and self-actualization. According to Adamakis and Zounhia (2016), this classification remains the same throughout a four-year undergraduate program and it is not affected by individual differences (Adamakis & Zounhia, 2016; Adamakis et al., 2013).

The international trend that exists nowadays toward the predominant importance of the physical activity and fitness goal in PE is confirmed, and also supported by previous literature (i.e. Adamakis et al., 2013; Kulinna et al., 2010; Matanin & Collier, 2003; Wang & Koh, 2006; Xiang, Lowy, & McBride, 2002). This PE priority has been set in order to combat the 'obesity crisis' and the high overweight rates, especially in children and adolescents, derived by the increased levels of physical inactivity in western developed countries (Dumith, Hallal, Reis, & Kohl, 2011). The school, through PE and holistic approaches, is considered an appropriate place in order to promote health and wellbeing, through enhanced physical activity (Reis, Salvo, Ogilvie, Lambert, Goenka, & Brownson, 2016). Also, there is a global trend that links PE with the public health goals and many recommendations have been made in order PE teacher education programs to incorporate these approaches (Webster, Webster, Russ, Molina, & Cribbs, 2014). In the Greek settings, the fitness component of the PE curriculum can be considered effective, as it has a positive effect on students' fitness performance and on their motives for participation in school PE (Goudas, Kolovelonis, Nikitopoulou, Hassandra, & Gerodimos, 2010). However, the Greek PE teachers' self-efficacy in delivering effectively the physical activity and fitness component of the curriculum is still very limited, contrary to their self-efficacy regarding the delivery of motor skill development outcome, which is the highest one (Gorozidis, Papaioannou, & Diggelidis, 2012). This may imply an inconsistency between PE teachers' theoretical belief systems and everyday practical implementation of the program, as well as insufficient knowledge on implementing physical activity programs. Further research is clearly needed in order to analyze whether or not curricular belief systems turn into action.

In order to answer the following research question regarding possible differences in belief systems according to undergraduate Faculty program attended, we examined students' perceptions of curricular outcomes from the three major Greek Faculties of PE and Sport, namely Athens, Thessaloniki and Komotini. Previous work with inservice teachers' curricular value orientations suggested that context, which is somewhat related to geography, influenced teachers' curricular priorities (Ennis & Chen, 1995). Also Kulinna and colleagues (2010) identified regional differences among US students' belief systems, which could not be explained. In the present study, some differences were obvious with small size effects. Students from Athens Faculty had the highest beliefs toward physical activity and fitness, as well as self-actualization, students from Thessaloniki Faculty had the highest beliefs toward social development and Komotini Faculty students had the lowest beliefs in all outcome goals. However, the outcomes' classification for all three Faculties remained the same, with the prevailing goal being physical activity and fitness. As in a previous Greek research (Adamakis & Zounhia, 2016), students classified their beliefs in a similar way and only the intensity of these beliefs was altered, apart from those related to motor skill development. A possible explanation of these similarities can be that all Faculties promote the physical activity and fitness outcome goal as the most important one.

The consistency of the initial finding (the higher priority of physical activity and fitness outcome) in the three Greek Faculties, as well as the same pattern classification of the outcome goals, might suggest that PE undergraduate programs provide the guiding force for these health-related PE beliefs to emerge. Previous research has concluded that the incorporation of general pedagogical knowledge into teaching was contingent on placement setting and was based on faculty commitment to a set of shared beliefs and programmatic consensus, non-traditional teaching approaches, as well as single powerful professor (Graber, 1993, 1995, 1996). However, taking also into account that most teachers' undergraduate programs often lack the previous features and do not have the power to make pre-service teachers challenge or alter their pre-existing beliefs (Adamakis & Zounhia, 2013, 2016), the most likely influence would seem to be media messages and/or personal experience related to the negative changes in youth population's health (Kulinna et al., 2010). The minor differences in beliefs' intensity could be attributed to some powerful individuals in the program, who may emphasize specific aspects of the curriculum (i.e. social development) and may be equally important in shaping student beliefs than an entire program of courses. Regarding female PE student teachers' higher beliefs toward all curricular outcome goals, most of the previous researches resulted in an opposite conclusion (i.e. Guan et al., 2005; Kulinna & Silverman, 2000; Placek et al., 1995). However, this is not the case for Greece since a previous research

indicated that these differences exist and female students hold higher beliefs compared to males (Adamakis et al., 2013). It is widely accepted that within PE teaching contexts, experiences and beliefs of this kind are mainly gender influenced. In a previous paper it was argued that female students in the Faculty of PE and Sport Science are 'socialized to more easily accept and perform emotional and expressive roles … and socially constructed gender roles, through which students adopt socially acceptable behaviors, seem to be stronger in Greece than other western countries' (Adamakis et al., 2013, p. 46). Taking into account that females PE teachers have higher self-efficacy than males regarding the deliverance of all curricular outcome goals, and most importantly toward physical activity and social development (Gorozidis, Papaioannou, & Diggelidis, 2012), this may imply that female PE student teachers might develop easier their future intentions to teach productively and efficiently than their male counterparts. Despite this differentiation, it seems that the performative culture of PE curricula, coupled with gendered norms of PE professionalization, affect students teachers' beliefs and learning experiences, restricting the content of pedagogical courses to surface knowledge transmission.

Any interpretation of the results from the current study should take into consideration the following limitations. Initially, the sample obtained was a convenience sample, which may limit its generalizability. However, the data was collected from three different Greek Faculties across three different regions, which may alleviate this issue. In addition, all information was self-reported and, therefore, might be subjected to social desirability response bias. However, the emphasis on anonymity at the beginning of the survey encouraged spontaneous answers. Despite these limitations, the findings of this study contribute to the growing literature on the factors associated with beliefs toward curricular outcome goals and how a variety of factors my influence those beliefs.

Conclusions

The current findings provide valuable information about PE students' belief system. Based on students' responses that have been asked to indicate their curricular beliefs toward four important PE outcome goals, the most important goal was physical activity and fitness, followed by self-actualization. Some differences were evident between male and female students, as well as students that attended different undergraduate programs, however these differences were mainly on beliefs' intensity, rather than on beliefs' classification. The findings imply that PE students form their beliefs mostly based on their previous experiences and media messages. These beliefs appear to be very solid and thus, undergraduate studies seem to have a small effect on their formation and modification. Lastly, it is possible that the performative culture of PE curricula, coupled with gendered norms of PE professionalization, affect students teachers' beliefs. Further investigation of PE teachers belief systems must be conducted in order to confirm if these beliefs are turned into action or not, and compare any new findings that may arise. Also, future studies, through qualitative approach research designs, could examine the deeper reasons behind the beliefs' classification.

Conflicts of interest - The author declares no conflicts of interest.

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