

HEALTH LOCUS OF CONTROL AND INTERNAL RESILIENCE FACTORS AMONG ADOLESCENTS IN BOTSWANA: A CASE-CONTROL STUDY WITH IMPLICATIONS FOR PHYSICAL EDUCATION

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ABSTRACT

Studies exploring self and health belief systems are keys to understanding the challenges to wholesome development of adolescents and creating interventions to enhance their mental, emotional and physical health status. Accordingly, this case-control study compared internal resilience factors and health locus of control among 1700 physical education and non- Physical Education students in the central and south-central regions of Botswana. The study variables were assessed using the Multidimensional Health Locus of Control Scale (MHLC) (Wallston et al., 1978:165) and a modified version of the Resilience Scale (Wagnild & Young, 1993:160). Analysis of variance of the loci of control and resilience scores were conducted. Although 78% of the resilience scores were well within the moderate range, females across the comparisons groups had significantly higher resilience scores than the males. On the MHLC subscales Physical Education students were significantly more likely than the referents to believe that their health is controlled by powerful others. Mean scores on the internal and chance loci of control scales were significantly higher among the males. Relationships among resilience and locus of control scores were statistically significant. Directions for future research and physical education interventions are offered.

Key words: Physical Education; Adolescents; Resilience; Health locus of control.

INTRODUCTION

Affirmative attitudes and beliefs about health and self, increase the likelihood that adolescents will behave wisely in high-risk situations and strive under adverse conditions such as poverty, bereavement, and other stressful life events (Bandura, 1997; Malcarne *et al.*, 2005:47; Prelow *et al.*, 2006:507). Accordingly, studies examining adolescents' convictions about causative agents for health and the degree to which they feel capable of enduring and thriving under stressful conditions, can contribute to a greater understanding of life-enhancing competencies among this age group. This study compares differences in the health locus of control and internal resilience factors between students taking or not taking elective Physical Education in Botswana junior secondary schools (JSS) in order to generate hypotheses to be later tested in a quasi-experimental study in the context of school physical education.

Extensive research, focusing on the key variables in the school context that are important in enhancing adolescents' physical and psycho-social development, supports the inclusion of physical education in the school curriculum (Calfas & Taylor, 1994:302; Goran *et al.* 1999:18; Langford & Carter, 2003:28; Anderson *et al.*, 2006:299). Participation in Physical education has been found to impact the way adolescent students think, feel, move and relate with others,

creating space to explore the what, when, why and how of motor skills, social skills, cognitive skills, safety skills, self-concept and lifestyle change (Arnold, 1988; Almond, 1989; Siedentop, 1994; Capel & Piotrowski, 2000; Hopper *et al.*, 2000; Liukkonen, *et al.*, 2007).

Since 1999, Physical Education has been an optional subject in JSS in Botswana. Before the 1990s, Physical Education was associated with extra-curricular activities in the nation's secondary schools. This situation dramatically changed following the Revised National Policy on Education (RNPE) (Republic of Botswana, 1994). Importantly, the revised policy embodied a redefined secondary school curriculum in line with the ideals of holistic and comprehensive education, multiple intelligences and social ecological model of youth development and wellness (Gardner, 1983; Republic of Botswana, 1994; Land, 2005:1). The RNPE stipulates that in addition to seven core courses (i.e. Mathematics, English, Setswana, Integrated Science, Agriculture, Social Studies and Moral Education), each JSS student must take a maximum of two optional subjects from the Practical Subject category (Art, Business Studies, Design and Technology and Home Economics) and one from the General Subject category, comprising of Music, Religious Education and Physical Education. This study was aimed at exploring differences in health locus of control and internal resilience factors between students taking Physical Education and those enrolled in other electives. To the best of our knowledge there is no empirical research directly examining these constructs in the context of elective Physical Education.

Conceptual framework

Health locus of control (HLC) is the degree to which people believe that they themselves, powerful others or chance influence their health and sickness (Wallston *et al.*, 1978:165; Taylor, 1999). People who believe they have control over their health or life events are called internals, in contrast to those who feel other people or chance is responsible for what happens to their health (externals). Literature indicates that internals are more likely to engage in wide range of health enhancing behaviours than those that believe in chance or social influence on health (Pitts & Phillips, 1998; Blaxter, 1990). They are also less prone to *learned helplessness* (Petersen *et al.*, 1995). In essence, perception of personal influence and individual responsibility over health is a modifying variable enhancing coping efficacy and engagement in a healthy lifestyle. A key role of Physical Education is enlarging young people's understanding of the significance of *lifestyle-health relationships* which ultimately influences the individual's assumptions, beliefs, values and options in relation to physical exercise, nutrition and leisure. Adolescents face a series of developmental challenges and increasingly take individual responsibility for health maintenance and disease prevention. It is therefore important to understand their HLC for timely Physical Education interventions to reduce health-risk behaviours and promote health-protective ones.

Resilience has been viewed as the process of and capacity for adapting successfully to challenging or threatening circumstances (Masten *et al.*, 1990:425). It has also been conceptualized as a relative tendency or ability to effectively resist risk and surmount adversity (Rutter, 2006:26). Researchers variously refer to adolescent resilience as a set of traits, a process or an outcome (Ahern, 2006:26; Rutter, 2007:205). Resilience is predicated on a sense of self-control, self-worth, self-reliance, positive approach to life, intrinsic motivation, intelligence and good sense of humor that enables a young person to thrive in the face of adversity and achieve wholesome development (Jessor, 1993:117; Cobb, 2001). Researchers

have also found that gender is related to resilience, depending on the context (Werner, 1989:72; Somchit, 2004:294). Lack of internal resilience factors has been consistently identified as a precursor to maladaptive behaviours that compromise adolescents' health and overall well-being (Rew & Horner, 2003:379; Everall *et al.*, 2006:461). In other words, internal resilience factors constitute a key protective factor moderating the impact of adversities on the individual (Kettelinus *et al.*, 1991:435; Sandberg *et al.*, 2001:523; Goodyer, 2002:383).

Evidence from research suggests that resilience is influenced by individual and environment factors. For instance, resilience has been described in terms of three factors: internal strengths to successfully cope with problematic situations; external support and resources; and an individual's interpersonal skills (Grotberg, 1995). The protective factors in the environment include: personal relationships within the family, neighbourhood or community, caring relatives or neighbors; favorite teachers, coaches, social workers, or priests; supportive and effective classroom environment; and connections to pro-social groups (Cobb, 2001; Tusaie & Dyer, 2004:3). Participation in organized physical activities is included among the external *protective factors* that challenge and help young people employ and develop their inner strengths and resources (Bernard, 1991; Baron, 1998; Hauser, 1999:1; Palen & Coatsworth, 2007:721). Involvement in such activities has been shown to foster positive connection to peer and adults, enhance adolescents' physical, mental and psycho-social skills and protect them from a host of health risk behaviours (Henderson & King, 1998:1; Santrock, 2001).

Objectives of the study

Building on the above framework, this study sought to:

1. Compare HLC and resilience scores between Physical Education and non-Physical Education students in Botswana junior secondary schools
2. Explore the correlations among resilience and HLC variables.
3. Examine whether the subjects' resilience and HLC scores vary by gender.

Hypotheses

Since research suggests that resilience is linked to locus of control, it was hypothesized that scores on the two measures will significantly correlate. Due to lack of prior research specifically comparing differences in HLC and resilience scores between Physical Education students and referents, the following null hypotheses were tested:

- There will be no significant difference in HLC scores between Physical Education students and referents in Botswana junior secondary schools.
- There will be no significant difference in resilience scores between the two study groups.
- There will be significant correlations among resilience and HLC variables.
- Gender will have no significant effect on the subjects' HLC and resilience scores.

METHOD

Design

This study was based on a descriptive (case-control) design in which students exposed to Physical Education (cases) are compared with their counterparts exposed to other elective subjects (controls or referents) on HLC and internal resilience factors. It is worth noting that the study does not assume any cause-and-effect relationships. Ideally, outcomes of school programs are best evaluated through a longitudinal design, with control and experimental groups, deliberate randomization of matched samples, manipulation of the independent variables and measures of baseline and post-intervention data (Torgerson & Torgerson, 2001:316). The present study was aimed at generating hypotheses to be later tested in a quasi-experimental design. Consequently, the participants were recruited from self-selected elective class sets, whereby students taking Physical Education and those taking other general subjects were identified to create two comparison groups.

Population and setting

This study was conducted in 25 out of 114 eligible public junior secondary schools in south-central and central regions of Botswana. The participating schools were drawn from Serowe, Sebina, Selibe-Phikwe, Gaborone, Gabane, Mogoditshane and Tlokweng. To be eligible, a school had to have offered physical education for the past three years. About 5 750 students in their third year during the winter of 2006 constituted the population of this study. Of this cohort of students, 1 840 were Physical Education students and 3 910 were not.

Sample

Across the school sites, 1 800 students were randomly selected to participate in the study. However, convenience samples of volunteer students were resorted to in schools where selected students were absent on the day of data collection or did not consent to participate. Convenience sampling is considered necessary in such cases to minimize non-response and low participation, which may adversely affect the representativeness of participants (Bryman & Cramer, 1994).

Procedures

The research protocol was approved by the University of Botswana's Office of Research and Development (ORD) and the Botswana Ministry of Education. Copies of research permits were submitted to the selected schools prior to data collection. All the sampled schools agreed to participate and nominated school staff to liaise with the researchers. Students were apprised of the purpose of the study and assured of confidentiality. Written and verbal informed consent was obtained from the students prior to questionnaire administration. The questionnaires were administered to the students between 14:00 and 16:00 – the period known in Botswana secondary education lexicon as *study time*. Completion of the questionnaires took approximately 40-60 minutes. To maintain privacy and confidentiality, no names were written on the questionnaires and the teachers were not involved in the data collection processes.

Measures

The Multidimensional Health Locus of Control Scales (MHLCS) (Wallston *et al.*, 1978:160) and a modified version of the Resilience Scale (Wagnild & Young, 1993:165) were used for this study. The MHLCS comprise 18 items measuring three dimensions of HLC: Internal Health Locus of Control (IHLC), Chance Health Locus of Control (CHLC), or Powerful Others Health Locus of Control (PHLC). Responses range from 1 = *strongly disagree* to 6 = *strongly agree*. Consequently, the total score for each subscale ranges from 6-36 (Wallston *et al.*, 1978:160), with a median score of 21 (Cross *et al.*, 2006:92). A high score on a subscale indicates a strong belief in that category of control.

A 14-item version of the Resilience Scale was used for this study. Responses ranged from 1 = *not at all true of me* to 5 = *very true of me*. Items 2, 3, 9, 12 & 13 are reversed-scored. Possible scores on this resilience scale range from 0-70, with higher score indicating higher resilience factors (Wagnild & Young, 1993:165). In order to ensure the reliability of the data generation process, the research instruments were pre-tested in two junior secondary schools in Gaborone. The items were considered satisfactory by respondents in terms of clarity, item order and wording.

Data analysis

A series of ANOVA's were performed to explore differences in mean scores on the dependent variables. Bivariate Pearson's correlations were also calculated to assess the relationships between resilience and HLC scores. Although there is ample evidence in the literature that the MHLCS and RC scales are valid and reliable instruments (Wagnild & Young, 1993:165; Wallston, 2005:623), their stability and suitability for the Botswana context were nevertheless assessed. Frequency and percentage of students in the comparison groups were examined as a function of gender and electives, using the chi-square test of independence. All analyses were carried out using the SPSS Version 15 (SPSS Inc. 2006). Statistical significance level was set at a probability value equal to or less than 0.05.

RESULTS

Out of the initial 1 800 questionnaire administered, only 1 764 were retrieved, from which 64 were excluded from analysis because of incomplete data. Thus, a total of 1 700 students participated in this study (a 94% response rate). Females and males were 882 (52%) and 818 (48%) respectively. The proportion of Physical Education students in the sample was 49% (n=840) and that of the referents was 51% (n=860). Chi-square test of independence indicated that the comparison groups did not differ by gender and percentage ($\chi^2 = 2.49, p = 0.12$ and $\chi^2 = .239, p = 0.63$ respectively). The participants' ages ranged between 16 and 17 years, with a mean of 16 ± 1 . Cronbach's Alpha coefficient for the adapted RS was 0.74. Reliability coefficients for the MHLCS subscales were 0.76, 0.72 and 0.81 for IHLC, CHLC and PHLC respectively. Test-retest correlations for the scales after a 4-week interval range from 0.78 to 0.84. Bivariate correlations among resilience scores and HLC measures are presented in Table 1.

TABLE 1. CORRELATIONS AMONG RESILIENCE AND HLC VARIABLES

Variable	2	3	4
1. Resilience	.15**	-.06*	.07**
2. IHLC	-	.07**	.25**
3. CHLC	-	-	.24**
4. PHLC	-	-	-

* $p < 0.05$ *** $p < 0.01$

Resilience was negatively and weakly correlated with CHLC ($r = -0.06$, $p < 0.05$). Positive but weak correlations were found among scores for IHLC and CHLC ($r = 0.07$, $p < 0.01$), resilience and PHLC ($r = .07$, $p < 0.01$) and resilience and IHLC ($r = 0.15$, $p < 0.01$). Positive correlations were also found among IHLC and PHLC scores ($r = 0.25$, $p < 0.01$) and between CHLC and PHLC measures ($r = 0.24$, $p < 0.01$), implying that students with higher PHLC scores also obtained higher scores for IHLC and CHLC.

TABLE 2. COMPARISON OF MEAN SCORES ON THE MHLC AND RC SCALES (N=1700)

Variable	Resilience			IHLC			CHLC			PHLC		
	\bar{X}	SD	F	\bar{X}	SD	F	\bar{X}	SD	F	\bar{X}	SD	F
PE students	48.24	7.3	1.146	23.91	5.3	.024	17.72	5.1	.964	24.77	6.0	5.345*
Referents	48.62	7.7		23.89	5.4		17.97	5.3		24.43	5.7	
Male	47.76	7.3	12.988***	24.2	5.3	6.518*	18.27	5.3	10.503***	25.12	5.7	.023
Female	49.06	7.6		23.6	5.4		17.45	5.1		25.08	6.0	

* $p < 0.05$ *** $p < 0.001$

Table 2 presents the mean scores, standard deviations and ANOVA results for the HLC and RS measures. Mean resilience scores for Physical Education and referents did not differ significantly. Overall, females had significantly higher resilience scores than males (49.06 vs. 47.76, $p < 0.05$). Median resilience score was 48 and about 77.8% of the respondents had a score of 42 or higher, indicating a moderate level of internal resilience factors among the study sample. A comparison of scores on the MHLC subscales indicated that regardless of electives, most participants believed that powerful others influence their health. Using a score above the median (i.e. 21) to classify the respondents, 78.8% of the respondents obtained highest scores on the powerful others subscale, followed by 74.5% and 30.6% on internal and chance subscales respectively. Physical Education students, however, attributed significantly more control to powerful others compared to the referents (24.77 vs. 24.43, $p < 0.05$). Further analysis revealed gender differences in belief in chance and internality. Males had significantly higher mean scores on the internal and chance scales than the females (24.2 vs. 23.6, $p < 0.05$ and 18.27 vs. 17.45, $p < 0.001$ respectively).

DISCUSSION

This study compares internal resilience factors and health locus of control between Physical Education and non- Physical Education students (N=1 700) drawn from the central and south central regions of Botswana. There were 840 Physical Education students and 860 referents. Females and males were 52% and 48% respectively. No significant differences were expected in the scores of the study samples partly due to the fact that multiple data and a number of possible confounding factors needed to be taken into consideration over time in order to generate valid results. Contrary to hypothesis, Physical Education students endorsed powerful others locus of control more than their counterparts enrolled in other electives. As hypothesized, the comparison groups did not differ significantly in their scores on the internal and chance loci of control subscales. However, males scored significantly higher than females in those measures. Previous studies have also reported greater internality among adolescent boys than adolescent girls (Kulas, 1996:721; Matlin, 2000; Bursik & Martin, 2006:1). Nonetheless, girls in this study reported higher resilience than the males. This finding supports earlier research indicating that despite gender differences in locus of control, girls have a higher capacity for resilience than boys due to socialization patterns that may engender differential socio-emotional development and relations with peers and adults (Tyler & Lichtenstein, 1997:27; Matlin, 2000; Broderick & Korteland, 2002:201; Somchit, 2004:294; Hampel & Petermann, 2005:73).

In line with one of the hypotheses, significant correlations were found among resilience and HLC measures. A weak and negative correlation was between resilience and belief that chance is in control of one's health outcomes. The positive correlations between resilience and internal health locus of control has been attributed to the fact that resilient people see themselves as having personal control and capability to engage in health promoting and adaptive behaviours (Bandura, 1997; Nowicki *et al.*, 1997:549; Rew & Horner, 2003:379; Ahern, 2006:175). The significant positive correlation between IHLC and PHLC shows that respondents simultaneously believe that personal control as well as the influence of powerful others are critical to illness and health outcomes. This finding validates previous studies showing that internal and external control beliefs may be combined in an individual (Wallston, 1992:183; Cross *et al.*, 2005:92; Afifi, 2007:1043). Literature suggests that any of these beliefs can be used to predict health practices and outcomes in the long run, that they are amenable to change, and that those who report more internal health locus of control and resilience are more likely to proactively seek health-promoting information and skills, realize for themselves the link between their lifestyle and health, and purposefully engage in initiatives associated with psycho-social and developmental well-being (Werner & Smith, 1992; Earvolino-Ramirez, 2007:73). As with all research reports, findings of this study must be interpreted in the context of its limitations, such as use of self-reported measures and *a priori* elective groups, relatively small sample size, and non-random assignment of subjects to Physical Education and control groups. Notwithstanding these limitations, this study extends the literature on resilience and health locus of control within the context of Physical Education.

Implications for Physical Education

The plethora of evidence linking internal locus of control and resilience to how people have been taught or treated by significant figures at different stages of development (Kroger, 1996; Rew & Horner, 2003:379; Resnick, 2000:157; Bandura, 2001:52) and the growing recognition

that the school system has an important role to play together with the family and community in enhancing favorable health and developmental outcomes for young people (Kidder, 1990; Bernard, 1991; Werner & Smith, 1992), suggest that Physical Education *context, content, methods* and *values* can provide necessary traction and leverage for promoting adolescents' self-development and thriving in the world. From the literature reviewed in this study it would seem logical that physical educators, like other school teachers, could help shape perceptions of internal (health) locus of control and enhance protective resources among school-aged adolescents by ensuring that Physical Education structures and processes are concertedly keyed to the following: acknowledge students' voices, interests and experiences; build on students' strengths and resources; communicate high expectations coupled with timely and supportive feedback; provide opportunity for self-reflection, autonomy and problem-solving; respond to diversity and different learning styles; encourage cooperative learning and development of interpersonal skills; facilitate participation in meaningful, goal-directed, self-defined and challenging activities; promote caring relationships and honoring interactions; enhance competencies in various curricular and co-curricular areas; partner with families, peers, co-teachers and community agencies to help students realize their personal potentials; address students' physical and psycho-social safety during activities; enhance students' health-related physical fitness; teach health-enhancing skills, knowledge and attitudes; and provide models demonstrating warmth, trust, humor, empathy, and affirmative behaviours.

Implications for further research

Many of the scholars whose work were reviewed in this paper suggest that participation in physical activity in school and post-school contexts is an external protective factor or precursor linked to psycho-social well-being in adolescence. Therefore there is a need to explore the possible mechanisms for mediating this protection in school Physical Education setting. The second challenge is to explore the interplay and path of influence of locus of control, resilience and experiences of adversities and life transitions in the selection or avoidance of elective Physical Education by secondary school students, and how these moderate the outcomes of Physical Education interventions. Third, given that researchers' suggest that resilience is multidimensional and affected by personal and social variables, context-specific Physical Education interventions must be identified. Fourth, since belief systems and resilience are developmental and situation specific, valid and reliable scales must be used to measure adolescents' psycho-social well-being in response to specific Physical Education interventions.

CONCLUSION

Studies on resilience and locus of control are of particular importance to physical educators in an HIV-AIDS-laden environment like Botswana, where a large segment of the population is either directly or indirectly affected by the social, physical, emotional, economic and other stressors associated with the disease. Understanding adolescents' risk factors relating to resilience and locus of control will help physical educators in this context identify and evaluate possible strategies for promoting the psycho-social health of adolescents, improving and sustaining their learning and enhancing their overall development. This study compared students exposed to Physical Education (cases) to their counterparts exposed to other elective subjects (controls or referents) on HLC and internal resilience factors. Elective Physical Education classes appear not to have yielded significantly greater internal resilience and health

locus of control in the case group compared to the referents. This finding has important implications for physical educators concerned with fostering healthy, nurturing beliefs among students and helping those with internal obstacles to efficacious actions. Longitudinal, multilevel and large scale studies are needed to explore the variables that are germane to Physical Education-based model for enhancing resilience and health locus of control in adolescents.

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