

Academy of Physical Education and Sport in Gdansk
University of Oradea
University of Balearic Islands

European Journal of Physical & Health Education

Social and Humanistic Perspective

Volume 3

Gdansk – Oradea – Palma 2010

Scientific Board

Octavian Bac – Universitatea din Oradea (Romania)
Iacob Hantiu – Universitatea din Oradea (Romania)
Tadeusz Huciński – Akademia Wychowania Fizycznego i Sportu w Gdańsku (Poland)
Vasile Marcu – Universitatea din Oradea (Romania)
Jerzy Pośpiech – Politechnika Opolska (Poland)
Pere Palou Sampol – Universitat de les Illes Balears (Spain)
Barbara Woynarowska – Uniwersytet Warszawski (Poland)
Earle F. Zeigler – Richmond (Canada)

Editorial Board

Josep Vidal Conti – Universitat de les Illes Balears (Spain)
Gheorghe Dumitrescu – Universitatea din Oradea (Romania)
Tomasz Frołowicz – Akademia Wychowania Fizycznego i Sportu w Gdańsku (Poland)
Zdzisław Kordel – Akademia Wychowania Fizycznego i Sportu w Gdańsku (Poland)
Eva Maradova – Univerzita Karlova v Praze (Czech Republic)
Stefan Maroti – Universitatea din Oradea (Romania)
Pere A. Borràs Rotger – Universitat de les Illes Balears (Spain)
Carmen Serbescu – Universitatea din Oradea (Romania)
Xavier Ponseti Verdaguer – Universitat de les Illes Balears (Spain)
Urszula Wendt – LMBruSS / Gdański Uniwersytet Medyczny (Poland)

Managing Editors

Iacob Hantiu (Deputy Editor-in-Chief), Tomasz Lisicki (Editor-in-Chief),
Pere Palou Sampol (Deputy Editor-in-Chief), Jan Wendt, Artur Ziółkowski (Administrative Editor)

Address of Editorial Office

Akademia Wychowania Fizycznego i Sportu
Wydział Wychowania Fizycznego
Katedra Wychowania Fizycznego
ul. Kazimierza Górskiego 1
80-336 Gdańsk, Poland
e-mail: eu-p-he@awf.gda.pl
www.journals.awf.gda.pl

Correction: Agnieszka Świerk

Cover project: Maciej Klejnglas

© Copyright by Akademia Wychowania Fizycznego i Sportu, Gdańsk 2009

© Copyright by Universitatea din Oradea, Oradea 2009

© Copyright by Universitat de les Illes Balears, Palma 2009

Authors are responsible for the opinions expressed in their papers.
All the papers published in this volume are accepted by the reviewers.
Names of reviewers are known to the Managing Editors.

Contents

Ken R. Lodewyk, Zan Gao <i>Beliefs, Reflective Persistence, and Achievement. Reflective Persistence Mediating the Role of Value-Laden Beliefs on Achievement in Secondary Physical Education Students</i>	5
Jürgen Kühnis <i>Health Literacy – a Superior Educational Objective</i>	13
Tomasz Frołowicz <i>The Polish Physical Education in Scientific Theory and School Practice – the European Context</i>	19
Jaume Cantallops Ramón, Josep Vidal Conti, Pere A. Borràs Rotger, Xavier Ponseti Verdaguer, Pere Palou Sampol <i>Effects of an Adapted Aquatics Programme for Children with Angelman Syndrome on the Emotional Dimension: a Qualitative Study</i>	31
Doriana Ioana Ciobanu <i>Relaxation and Breathing Techniques – Positive Factors in the Deployment of Pregnant Woman’s Labor and Delivery</i>	39
Information for the Paper Authors	49

Beliefs, Reflective Persistence, and Achievement. Reflective Persistence Mediating the Role of Value-Laden Beliefs on Achievement in Secondary Physical Education Students

Ken R. Lodewyk¹, Zan Gao²

¹Brock University, Ontario, Canada

²University of Utah, Salt Lake City, Utah, USA

Abstract

Researchers in physical education have advocated more studies into associations among students' value-laden beliefs, use of learning strategies, and indicators of achievement. This study is a response to such calls as it investigates whether reflective persistence – one's ability to think critically while regulating one's effort – mediates the influence of value-laden beliefs (e.g., intrinsic and extrinsic goal orientation, task value, and the need for cognition) on physical education achievement among 295 high school students. Extrinsic goal orientation was dropped for lack of internal consistency. As expected, the study variables related positively with one another. The satisfactory model fit and moderate strength of the pathways within the hypothesized model indicated that reflective persistence partially mediated the influence of need for cognition, intrinsic goal orientation, and task value on indices of physical education achievement. This study illuminates important interactions among value-laden beliefs and reflective persistence on achievement along with potential implications for physical education practitioners and scholars.

Key words: Cognition, Critical Thinking, Effort, Intrinsic Goal Orientation Reflective Persistence as a Mediator of Value-Laden Beliefs and Indices.

Introduction

A surge in amotivation and attrition in adolescents' physical education experiences [25] has prompted calls for more research into potential factors. Cognitive mediation theory posits that students tend to construct the meanings, goals, and strategies that they use to learn freely and actively. In particular, mental learning processes consist of cognitions like beliefs, motivation, and use of strategies which influence academic learning and mediate instruction with student achievement [21]. Educational research has consistently supported the influential role of cognitive processes like beliefs, motivation, and knowledge on superior self-regulated learning, achievement, and learning [16]; yet, there is a surfeit of similar research in physical education settings. We respond to this shortage by performing a study grounded in cognitive mediation theory [22] that investigates the potential mediating role of reflective persistence in the relationship between value-laden beliefs (e.g., intrinsic and extrinsic goal orientation, task value, and the need for cognition) and estimates of achievement in high school physical education students.

Value-laden Beliefs

Value-laden beliefs about the need for cognition [14], goals [1], and the task value construct from expectancy-value theory [26] have been linked to cognitive processing and academic achievement. Task value is a learner's beliefs about how interesting (enjoyable), important (attainment value), useful (utility), and costly (negative consequences) they perceive engaging in a task or course to be. Typically, stronger associations exist between task value and achievement-related outcomes like memory, attention, and depth of cognitive processing than with achievement [19]. For example, goal orientation is an important determinant of successful self-regulation and deeper approaches to studying because goals enable students to organize patterns of behavior so they can accomplish their goals [6]. Learners with an intrinsic goal-orientation in physical education tend to endeavor to develop and display ability more for understanding, effort, and curiosity than for rewards like grades or superiority over peers [29]. In contrast, those with goals that are more extrinsically oriented tend to strive to demonstrate their ability

relative to others, achieve success by mainly relying on ability rather than effort, perform more for a grade and/or to please others or to avoid failure than to learn or master the content, tend to avoid challenging tasks, and are prone to using superficial learning strategies [1, 19]. A final belief construct to be considered in this study is the need for cognition. This construct symbolizes the degree to which one employs and enjoys attempting to utilize cognition in a particular domain or setting [9]. While need for cognition has yet to be investigated in physical education, educational researchers have noted relations between believing in the need for cognition and effort, attentiveness, enjoyment, and success on complex learning tasks [14].

Reflective Persistence

Researchers have found that most successful learners tend to be more effortful, self-regulated, and reflective in a variety of educational settings including physical education [11, 28]. Effort regulation and critical thinking are learning strategies that appear to mediate understanding, learning, and achievement in academic settings [5]. Effort regulation is the strategic management of one's attention and persistence to fulfill a goal amidst competing distractions like a lack of interest in the task or subject [17]. Meanwhile, critical thinking is a progressive and reflective application of existing knowledge towards the goal of resolving novel challenges by making informed choices that result from effective gathering of evidence, evaluating values and ideas, managing emotions, and using skills like inductive and deductive reasoning [17]. R. McBride [12] has asserted that this kind of reasoning is important in physical education because it can be applied during common cognitive tasks like consciously deciding appropriate and justifiable movement responses in particular circumstances. In physical education, M.A. Solmon and A.M. Lee [23] found that items related to problem-solving and effort regulation loaded on the same factor and positively related to confidence, attention, persistence, and use of strategies. Hence, reflective persistence in this study will reflect a joint ability to think critically while regulating one's effort.

Theoretical Model

Experts [e.g., 20, 21, 29] have called for more research into how beliefs, learning strategies, and achievement interact and function in physical education. On this basis, we investigate the potential mediating effect of reflective persistence on the role of beliefs to achievement in physical education (see the model in Figure 1). Compared to a moderating variable that is influential in the degree or direction of relation between two variables, a mediating variable actually indirectly accounts for that relationship [24]. So the influence of students' value beliefs (task value, goal orientation, need for cognition) on achievement is expected to function indirectly through (be mediated by) their reflective persistence. This is justified in aforementioned studies and because it is often on the basis of students' beliefs that they implement tactics and strategies and construct products to succeed on learning tasks. For example, Y. Ommundsen [15] revealed positive links in physical education between effort regulation, elaboration, help-seeking, and beliefs that ability is malleable or learned rather than being a fixed entity.

Method

Participants and Procedure

During their regular physical education class time, 309 volunteering students in grade nine and ten anonymously completed four short questionnaires that were administered by the author or a trained research assistant. Students ($n = 14$) with Mahalanobis distance values (multivariate outliers) exceeding the recommended level were deleted [24]. Consequently, the final sample consisted of 295 (95 males; 200 females) in grade 9 ($n = 220$) and 10 ($n = 75$) from two urban public ($n = 81$) and one rural independent high school ($n = 55$) in south-central Canada (SCC) and one semi-urban independent (religious-based) school ($n = 159$) in California (CA). Students' were predominately middle socioeconomic status and their ethnicities ranged between Caucasian (73.9%), Asian (11.5%), and other (14.2%).

Each physical education class in the sample was segregated by gender, taught by a teacher of the same gender (e.g., females with a female teacher), and were taught by teachers

reporting use of mainly the direct method of instruction. Minor curricular differences were noted between regions. For example, classes in both regions met for approximately 70–85 minutes on alternate days and taught a similar distribution of content across team sports (35%), individual sports (10%), fitness (25%), developmental games (12.5%), and health (17.5%). Grades were also distributed similarly between skill (22.5%), fitness (15%), knowledge (17.5%), and attitude (45%). In the SCC schools, the grade nine or ten physical education course was required of all students whereas in the CA school students participating on a school sports team did not need to enroll in high school physical education.

Measures

Value-Laden Beliefs and Reflective Persistence. To assess students' beliefs about the need for cognition in physical education, eight of the most physical education relevant items from the 18-item *Need for Cognition Questionnaire* (NCQ) [9] were modified for physical education and used in this study. Individuals who rate the importance of cognition in physical education high tend to enjoy solving cognitive challenges that demand reasoning, critical-thinking, and problem-solving. The NCQ has been used extensively in previous educational research with satisfactory construct validity and internal consistency reliability coefficients near .90 [9]. Sample items are: "I really enjoy tasks in physical education that involve coming up with new solutions to problems" and "I prefer tasks in physical education that make me think than those that do not".

To assess other value-laden beliefs and reflective persistence, four intrinsic-goal orientation (IGO) items, four extrinsic-goal orientation (EGO), six task value (TV) items, and eight reflective persistence (RP) items (comprised of four critical-thinking items and four effort-regulation items) were used from corresponding scales on the *Motivated Strategies for Learning Questionnaire* (MSLQ) [17]. The MSLQ is a self-report instrument that has demonstrated satisfactory reliability and validity from its use across several domains including physical education as an assessment tool of high school or college students' motivational orientations and use of learning

strategies within a course [15, 16, 17; for a review see 5]. Students assigned ratings on a 7-point Likert scale ("1 = *not at all true of me*" to "7 = *very true of me*"). One critical-thinking item from the MSLQ was not used since it was not conceptually relevant to high school physical education programs. A sample items include: "In a class like this, I like course material that makes me more curious, even if it is hard to learn." (IGO); "I want to do well in physical education because it is important to show my ability to my family, friends, teacher, or others." (EGO); "I am very interested in the material we learn in physical education." (TV); "When an opinion or idea is given in physical education, I try to decide if there is good evidence to back it up." (RP); and "Even when the work in physical education is dull and uninteresting, I manage to keep working hard." (RP). A pilot study of the measures using a separate group of grade 9 and 10 students ($n = 10$) led to minor modifications to the text of a few items to ensure their suitability with the age and domain of students in this sample. For example, a word like "ambiguous" was changed to "unclear".

Indices of Achievement. Students reported demographic information such as their gender, date of birth, geographical region, ethnicity, and estimates of the grade they typically earn in physical education on a *Demographic Questionnaire* (DQ). Several schools were willing to provide students' ($n = 53$) most recent physical education semester or course grade (%; PEGR). In relation to grading, a first-class standing (A) in the CA school equated to a 95% compared to an 80% in the SSC schools. To standardize these different grading schemes, physical education grades (PEGR) and estimates of achievement (PEA) for each district were changed to z-scores (zPEA). To establish validity for zPEA, the intra-class correlation coefficient (.49) between PEA and PEGR along with the internal consistency coefficient (.66) of PEA were computed. Self-reported estimates of achievement have been validly used in classroom [27], physical activity [7], and physical education [3, 4] research settings. The validity of the achievement variable was further developed using data collected on respective assessment and grading practices and course content from a *Teacher's Demo-*

graphic Questionnaire that was completed by each physical education instructor in the study. In this survey, teachers reported assessing students' achievement using a variety of well-designed rating scales, checklists, and cognitive and skill tests similar to the assessment protocol recommended by J.R. Rink [18]. Despite this validation process, the validity of PEA in this study is noted as a caution and is reported as an indicator of achievement rather than an actual performance score.

Data Analyses

First, Cronbach's alpha coefficients were calculated to ensure the internal consistency of the self-report measures. Second, descriptive statistics and Pearson product-moment correlations were computed to describe the sample (e.g., kurtosis, skew) and evaluate the correlations of the variables. Each of the variables was normally distributed [24]. Third, Amos 5.0 [2] was used to conduct a maximum likelihood estimation to evaluate the fit of the model to the data. Acceptable model fit was assessed using multiple indices. A nonsignificant chi-square (χ^2) indicates the overall fit of the model to the data [24]. The comparative fit index (CFI), the Tucker-Lewis index (TLI), and the normed fit index (NFI) test the proportionate improvement in fit by comparing the hypothesized model with the baseline model (independence model). Minimally acceptable fit was based on CFI, TLI, and NFI values of .90; values approximating .95 indicated good fit [8]. Root mean square error of approximation (RMSEA) represents closeness of fit, and values approximating .06 and zero demonstrate close and exact fit of the model [8]. Fourth, to test the

mediating effect of RP on beliefs and achievement, the significance of relevant paths were assessed [2]. Path significance was based on the critical ratio (CR), which is the parameter estimate divided by an estimate of the standard error. When the CR was larger than 1.96 for a regression weight, that path was significant at the .05 level. That is, its estimated path parameter is significant.

Results

To recapitulate, we asserted that the variables would positively relate and that reflective persistence would mediate the influence of advantageous value-laden beliefs on achievement in physical education. K.M. Loewenthal [10] explains that alpha coefficients above .60 are satisfactory in factors with less than 10 items. With the exception of extrinsic goal orientation (.58) which was omitted from subsequent analyses, internal consistency of the study variables were deemed to be satisfactory ($\alpha = .68 - .86$). Relations between each of the constructs met expectations by being statistically ($p < .01$) and positively associated with one another. Except for between TV and NC, relations were moderate ($r > .40$) among each belief and between RP and each belief. Table 1 illustrates descriptive statistics, internal consistency coefficients, and bivariate correlations.

The hypothesized model demonstrated a good fit to the data, $\chi^2 (4, N = 295) = .6$, $p = .892$, CFI = 1, TLI = 1, NFI = .999, RMSEA = .00. Figure 1 shows the path diagram and standardized path coefficients of the hypothesized model.

Table 1. Construct Means, Standard Deviations, Internal Consistency Reliability Coefficients (alpha) and Pearson Correlations (N=295)

Predictor	Alpha	M	SD	PEA	NC	IGO	TV
PEA	—	—	—	—			
NC	.68	2.93	.57	.16*	—		
IGO	.77	3.94	1.28	.16*	.41*	—	
TV	.86	4.21	1.31	.17*	.33*	.74*	—
RP	.71	4.27	.97	.31*	.49*	.62*	.58*

Note. PEA = Achievement in physical education; NC= Need for Cognition; IGO = Intrinsic Goal Orientation; TV = Task Value; RP = Reflective Persistence. * $p < .01$

All path coefficients were statistically significant at $p < .05$. The path coefficient from RP to zPEA was significant ($\gamma_{RP-PEA} = .31$). IGO had the highest significant direct effect on RP ($\gamma_{IGO-SRSL} = .32$) followed by NFC ($\gamma_{NFC-RP} = .27$) and TV ($\gamma_{TV-RP} = .25$). The overall variance in RP and zPEA explained by the model was 48% and 10%, respectively, which signaled that the model

was relatively well represented by the data. Since the indirect effects of IGO, TV, and NC on zPEA levels via RP were satisfactory yet small ($\gamma = .08$ to $.10$), the collective results indicate that RP partially mediates relations between value beliefs and zPEA within the hypothesized model (Arbuckle, 2003).

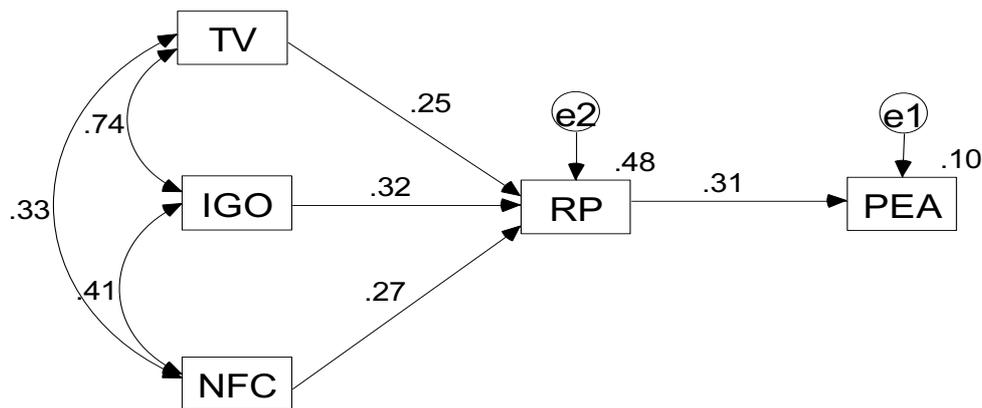


Figure 1. Notes. All paths are significant. The coefficients on the straight lines are the standardized regression weights; the coefficients on two-headed arrows are the correlations between the pairs of independent variables; the coefficients right above the rectangles of mediate and dependent variables are squared multiple correlations.

Discussion

This study revealed that believing that cognition in physical education is necessary, valuing the content of the subject, and having an intrinsic goal orientation might serve as antecedents to indices of students' achievement which can be mediated by reflective persistence – Figure 1. In part, this may be explained by the role of intrinsically motivated physical education students who then tend to be more strategic and motivated, expend more effort, demonstrate less anxiety, select more difficult tasks, experience more enjoyment, satisfaction, and interest in physical activity, think and process information less superficially, and are more intrinsically motivated to participate [29]. Task value also appears to have an interactive role on achievement. M.A. Solmon and A.M. Lee [22] found that physical education students with more skill had higher perceived competence and practice success yet used strategic learning less than students with lower levels of skill and perceived competence. They con-

cluded that learning strategies such as reflection and persistence may only be useful when students actually value them as so. Our results suggest similarly, that students who believe the content of physical education is important, useful, and interesting, and worth strategic learning will be more likely to reflectively persist and subsequently achieve higher grades in physical education. In regards to the need for cognition, our results support other educational research signaling that individuals reporting a high need for cognition in a domain may more willingly and deeply process information, problem-solve, persist, and achieve [14].

To optimally foster this interactive process (Figure 1), educators might, for example, help students to appropriately scaffold their learning, perceive tasks as challenging yet achievable, and to persist in spite of difficulties. To foster more intrinsically-oriented goals, physical educators might consider teaching students how to improve their learning and performance to earn

higher grades, minimize social comparisons and excessive competition, provide opportunities for reflection, and emphasize and assess the collaborative process of improvement and learning rather than only performance products [1, 13]. Physical educators could increase students' awareness in the importance of cognition in physical education by, for example, teaching students the various forms of useful knowledge (i.e., strategic, declarative, procedural, and conditional) in physical education and how that knowledge can be useful and transferable between various movement forms (i.e., dance, games, gymnastics, fitness) and domains (i.e., science, math, social sciences).

There were several noteworthy limitations in this study. First, since measurements in this study were conducted at only one point in time and were domain-specific, they are insufficiently specific to assess the recursive nature of self-regulated learning. Second, the learning process is so complex, any study investigating it inherently fails to fully account for its many factors. For example, classroom dynamics (e.g., socio-emotional climate), instructional methods (e.g., perceived autonomy support), and motivational beliefs (e.g., self-efficacy) are likely contributors to the high levels of unaccounted for variance in this study. Third, the transferability of any study is limited to similar samples. We acknowledge that the lack of gender and ethnic balance in our sample and the limitation in inferring this result on samples with demographics that vary signifi-

cantly from ours. Fourth, despite adequate reliability and validity for the self-report measures used [5, 17], it would be useful if future studies incorporated more qualitative (e.g., interviews or stimulated recalls) methods. Finally, use of learning strategies in physical education is somewhat dependent on prior knowledge [21]. It would be useful to include a measure of initial knowledge or ability in future studies having similar aims.

Despite these limitations, the results add insight into the potential importance of reflectively persisting and having advantageous beliefs about the need for cognition, task value, and intrinsic goals in physical education. This may be particularly true since learners with lower levels of one belief appear prone to also having less advantageous levels in the other beliefs. The mediating influence of reflective persistence warrants a beckoning of physical educators to develop students' ability to critically think and to persist amidst difficulty. We concur with M.A.Solmon's [20] assertion that physical educators should create "an environment that encourages students to make decisions to engage in learning activities actively and with effort, and that includes fostering positive attitudes about class and eliciting cognitions that will produce achievement" [20, p. 156]. Future investigations can add to this knowledge about the potential mediating role of learning strategies on beliefs and achievement and facilitate the design of more optimal instruction.

BIBLIOGRAPHY

1. Ames C. (1992). Classroom goals, structures, and student motivation. *Journal of Educational Psychology*, 84, 261–271.
2. Arbuckle J. L. (2003). Amos 5.0 update to the Amos user's guide. Chicago, IL: SPSS.
3. Author (2009). Exploring relations among achievement and beliefs about epistemology and ability in high school physical education students. *The Physical Educator*, 66(3), 124–138.
4. Author, Gammage K., Sullivan P. (2009). Relations Between Body Size Discrepancy, Gender, and Indices of Motivation and Achievement in High School Physical Education. *Journal of Teaching in Physical Education*. 28(4), 362–377.
5. Duncan T.G., McKeachie W.J. (2005). The making of the motivated strategies for learning questionnaire. *Educational Psychologist*, 40, 117–128.
6. Ferrer-Caja E., Weiss M.R. (2000). Predictors of intrinsic motivation among adolescent students in physical education. *Research Quarterly for Sport and Exercise*, 71, 267–279.
7. Godin G., Shephard R.J. (1985). A simple method to assess exercise behavior in the community. *Canadian Journal of Applied Sport Sciences*, 10, 141–146.
8. Hu L., Bentler P.M. (1999). Cut off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternative. *Structural Equation Modeling*, 6, 1–55.
9. Kardash C.M., Scholes R.J. (1996). Effects of pre-existing beliefs, epistemological beliefs and need for cogni-

- tion on interpretation of controversial issues. *Journal of Educational Psychology*, 88(2), 260–271.
10. Loewenthal K. M. (1996). *An introduction to psychological tests and scales*. London: UCL Press Limited.
 11. Luke I., Hardy C.A. (1999). Cognitive strategies. In C.A. Hardy & M. Mawer (Eds.), *Learning and Teaching in Physical Education* (pp. 59–79). Philadelphia, PA: Falmer Press.
 12. McBride R. (1991). Critical thinking – an overview with implications for physical education. *Journal of Teaching in Physical Education*, 11, 112–125.
 13. Ntoumanis N. (2005). A prospective study of participation in optional school physical education using a self-determination theory framework. *Journal of Educational Psychology*, 97, 444–453.
 14. Nussbaum E.M., Bendixen L.D. (2003). Approaching and avoiding arguments: The role of epistemological beliefs, need for cognition, and extraverted personality traits. *Contemporary Educational Psychology*, 28, 573–595.
 15. Ommundsen Y. (2003). Implicit theories of ability and self-regulation strategies in physical education classes. *Educational Psychology*, 23, 141–157.
 16. Pintrich P.R., Marx R.W., Boyle R.A. (1993). Beyond cold conceptual change: The role of motivational beliefs and classroom contextual factors in the process of conceptual change. *Review of Educational Research*, 63, 167–199.
 17. Pintrich P.R., Smith D.A., Garcia T., McKeachie W.J. (1991). *A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ)* (Technical Report No. 91-B-004). Ann Arbor, MI: University of Michigan, School of Education.
 18. Rink J.R. (2002). *Teaching Physical Education for Learning* (4th Ed.). Toronto, ON: McGraw-Hill.
 19. Roberts G.C. (2001). *Advances in motivation in sport and exercise*. Champaign, IL: Human Kinetics.
 20. Solmon M.A. (2003). Student issues in physical education classes: Attitude, cognition, and motivation. In: S.J. Silverman, C.D. Ennis (Eds.), *Student learning in physical education: Applying research to enhance instruction* (2nd ed., pp. 295–310). Champaign, IL: Human Kinetics.
 21. Solmon M.A. (2006). Learner cognition. In: D. Kirk, D. MacDonald, M. O’Sullivan (Eds.). *The Handbook of Physical Education* (pp. 226–241). London, England: Sage.
 22. Solmon M.A., Lee A.M. (1996). Entry characteristics, practice variables, and cognition: Student mediation of instruction. *Journal of Teaching in Physical Education*, 15: 136–150.
 23. Solmon M.A., Lee A.M. (1997). Development of an instrument to assess cognitive processes in physical education classes. *Research Quarterly for Exercise and Sport*, 68, 152–160.
 24. Tabachnick B.G., Fidell L.S. (2006). *Using multivariate statistics* (5th Ed.). New York: HarperCollins.
 25. Trudeau F., Shephard R. J. (2005). Contribution of school programmes to physical activity levels and attitudes in children and adults. *Sports Medicine*, 35, 89–105.
 26. Wigfield A., Eccles J.S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology*, 25, 116–119.
 27. Winne P.H., Jamieson-Noel D. (2002). Exploring students’ calibration of self reports about study tactics and achievement. *Contemporary Educational Psychology*, 27, 551–572.
 28. Winne P.H., Marx R.W. (1989). A cognitive processing analysis of motivation within classroom tasks. In: C. Ames, R. Ames (Eds.), *Research on motivation in education* (pp. 223–257). Orlando, FL: Academic Press.
 29. Xiang P., Chen A., Bruene A. (2005). Interactive impact of intrinsic motivators and extrinsic rewards on behavior and motivation outcomes. *Journal of Teaching in Physical Education*, 24, 179–197.

Received: December 2009

Accepted: February 2010

Published: March 2010

Correspondence

Ken R. Lodewyk
 Brock University,
 WC 281, Department of Physical Education and Kinesiology,
 500 Glenridge Avenue,
 St. Catharines, Ontario, Canada, L2S 3A1.
 Work Phone: 905-688-5550 (5220).
 Work Fax: 905-688-8364
 e-mail: klodewyk@brocku.ca

Health Literacy – a Superior Educational Objective

Jürgen Kühnis^{1,2}

¹Pädagogische Hochschule Zentralschweiz (PHZ)
(University of Teacher Education of Central Switzerland)

²Private University (UFL), Liechtenstein

Abstract

Health education has gained in significance as a result of lifestyles changes which have caused an increase in obesity, physical inactivity and motor disorders in school children. Many children and adolescents reduce their physical activity in favour of sedentary and media-dominated daily routines. Today, school teachers are faced primarily with the challenge of counteracting automated, unhealthy behavior in these children. Because the school age is a very important period of life, in which healthy long-term lifestyle patterns can be established, teacher training institutions are consequently required to intensify health literacy in their courses of study. In this paper two central academic health topics (exercise and nutrition) are discussed and general recommendations for their implementation are identified.

Key words: health education, teacher training, nutritional habits, exercise promotion.

Introduction

Exercise and nutrition are regarded as one of the key factors for adolescents in the context of health education [8, 17, 24]. Various exercise stimuli, a sufficient dose of daily physical activity as well as balanced nourishment are indispensable for healthy development and long-term well-being [10, 11, 22]. Health-conscious decision-making, responsibility and attitude can only be integrated into daily life through an early education in health and exercise. "Effective prevention must begin where the development of specific risk factors can be effectively precluded" [12, author's translation].

Scientific studies have shown that the behavioral pattern in exercise and nourishment has changed dramatically in the last two generations. An increasing prevalence of overweight and poorer motor skills has been demonstrated worldwide [4, 5, 9, 27]. Many growing children exhibit weaknesses in coordination and deportment, and already evince problems with their basic motor skills such as in climbing or balancing. In a review of 54 studies carried out in 20 countries over the period 1975 to 2000 [4] established that the motor fitness of 6 to 17 year olds had fallen on average by more than 10% in the majority of spheres of capability (primarily in endurance and mobility). Today many growing children and youth fail to meet the recommended guidelines of at least an hour of moderate to

vigorous physical activity (MVPA) per day [22]. As a consequence of such an insufficient incentive for exercise the energy balance is destabilized.

The detrimental effects of our consumer and media-oriented society appear obvious today. In the last decades not only has the range of foodstuffs broadened, consumer habits of the youth are also being manipulated heavily. Today everything is available everywhere and at all times. As a consequence of this oversupply and the continuous availability of foodstuffs together with the changing purchasing patterns and family structure (i.a. increasing numbers of working mothers and divorce rate) the communal family meal appears to have been reduced in significance [11]. Already during childhood meals all too often simply consist of calorie-rich snacks (e.g. fast or convenience food, sweets and energy drinks).

A central role in the development of obesity is attributed to unbalanced, excessive eating patterns [16, 18]. Within Europe, the highest levels of childhood overweight (30%–36%) can be found in Mediterranean countries and are predicted to increase up to 41% by 2010 [27]. In addition, an inverse relationship can be noted between social class affiliation and obesity [26], i.e. an increased prevalence among children from families of lower socio-economic status

(primarily with a migrant background). The morbidity risk (Figure 1) already covers a multiplicity of somatic and psychosocial concomitant diseases in school age, i.e. cardiovascular risk factors (hypertension, high blood lipids, insulin resistance) orthopedic complications (foot deformity, changes in knee or hip joint) and psychosocial barriers (mobbing, stigmatization, low-self esteem, depression) [21]. The possible long-term effects are problematic, i.e. the beginning of progressive chronic illness, e.g. there is a high probability that many overweight children will become overweight adults [20]. Because overweight is subjected to multifactorial determinants, prevention and therapy are not simple; they often cause a long-term change of lifestyle of the persons concerned and their personal environment.

In addition, the current exercise spectrum amongst children and adolescents frequently appears to have been reduced in favor of passive media-oriented leisure time activities (television, computer, game consoles). This physical inactivity is already manifested in early childhood and becomes more intense with increasing age (above all in adolescence) [3, 23]. In an apparent contradiction to this, club and informal leisure sports among children and adolescents continue to be rated highly today [5]. However, this sporting activity does not appear to compensate, or only partly, for the lack of exercise in daily routine.

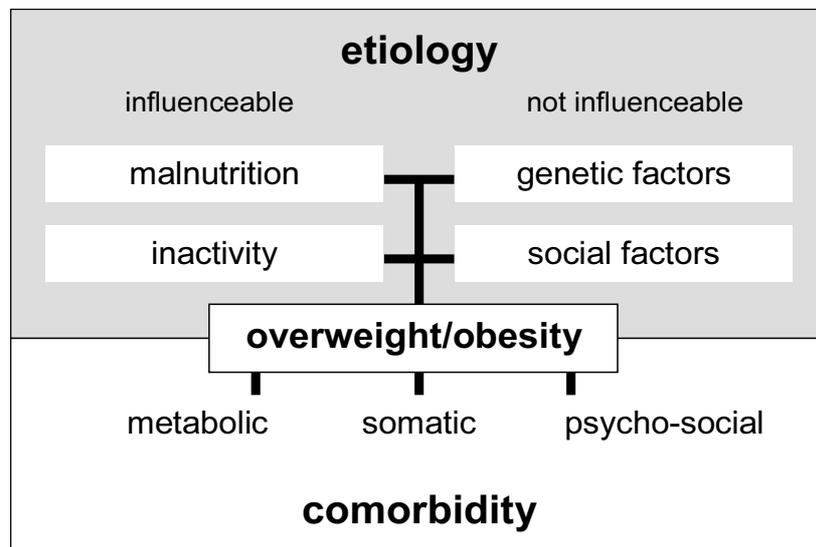


Figure 1. Central risk factors and consequences of overweight and obesity

With this background and the necessity to counteract the loss of motor activity in daily routine, the importance of an active commuting to school is also enhanced in its preventive significance. A regular human powered mobility to school (HPM) increases the daily level of activity and energy consumption, promotes the heart and circulatory systems, is environmentally friendly and an appropriate starting point for the less active and overweight [1, 6, 15]. 3000 steps equate to approximately 30 minutes of sporting activity. As part of a child's world, an active commuting to school opens up multiple spatial,

social and nature experiences which are essential to his integral development.

Development of health literacy

In short, the development of health literacy today is among the principal educational challenges and will according to the trends outlined continue to increase in significance in the near future. Thereby, the key to promote health is to be found in daily lifestyle and the final concern is that health conscious lifestyle is integrated into daily life such that it becomes a natural habit. A long-lasting positive orientation towards health

education (Figure 2) must thus consider individual lifestyle and environmental habits equally. Lack of exercise and poor nutrition are risk factors which can potentially be influenced. The family of origin is the primary point of reference in the lifestyle context of growing children. The lifestyle in the parental home defines the development and attitude of the children [2, 19]. In addition to the family, the school is also a central biographical context which can influence the development of a healthy lifestyle; here all children and adolescents can be impacted, regardless of social and cultural origin. Over a relatively long period of one's life, it is the school setting which defines the daily routine for adolescents and, at the same time, is the only institution (affiliated with an educational assignment) which brings all children into contact with exercise and sport. Regular exercise, health and well-being are all inter-related. The school thus possesses the unique opportunity for the health promotion in children and adolescents; but of course health education doesn't end in school areas.

Health begins in mind; the primary objective however is the acquiring of health literacy – defined as the capacity of each individual to make decisions in daily life which impacts health in a positive manner [13]. Health furtherance is based on the WHO definition (1986)"... on a process to permit all people a greater capacity for the self-determination of their health and thus to empower them to enhance their health" (authors translation). Health affects all aspects of life (setting approach) according to this practically-oriented understanding. Correspondingly, health education cannot simply, either at school or university, be considered as a subject with only of some hours assigned, but is an integral part of an interdisciplinary curriculum and school development [14].

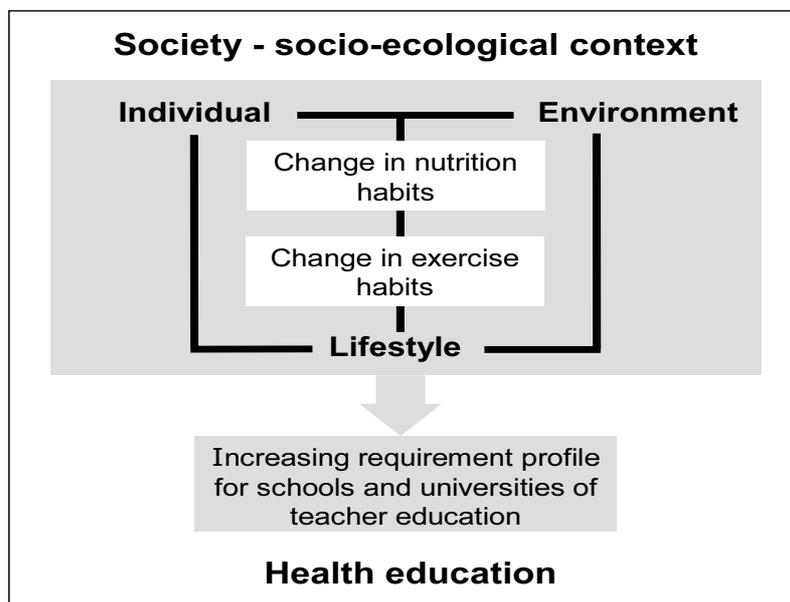


Figure 2. Necessities for enhanced health education

Nutritional habits and exercise promotion

The basis for nutritional and exercise modes is laid down during school age [19, 20]. An adequate balance, appropriate to a student's

age, between energy intake and consumption can only be achieved by intensifying nutritional education concomitantly with physical activities. At school level this involves both making aware and validating recommendations for health

awareness in nutritional habits. In addition to the knowledge of foodstuffs, their compositions and effects, this requires primarily a critical discussion of personal dietary habits and alternative arrangements. Currently a multiplicity of orientation guidelines is available in this respect¹.

Lifestyle and activity orientation

Exercise and nutrition can be presented fundamentally using an approach which is both lifestyle and activity oriented. Possible health effects as well as the intended educational impact of both topics are not given per se, but depend on the teaching materials, the effectiveness of the presentation as well as the provision of a health promoting framework [14]. Finally, a successful implementation locally can only be successful if the teaching staff, within the framework of the teaching program, be self-critical of their own eating and sporting activities and can gather and quote from their own experiences.

In the current report 2009 on the new teaching schedule 21 for German-speaking Switzerland (www.lehrplan.ch) exercise and nutrition are set out as primary educational objectives which are to be carried out on an interdisciplinary basis. Central is the orientation towards expertise, based on activity-orientated lessons, which permits the development and application of health literacy in every day life. The creation of such learning settings contributes not only to enhancing individual health; they strengthen the school image externally by presenting the profile of a modern health-promoting institution. The burden of sitting during the school day, the natural drive for movement as well as the reduced attention span of growing children require a regulated exchange between concentration and relaxation phases.

Movement serves not only as a tool for such compensation in a rhythmic cycle, but can finally have an effect on the individual learning and school atmosphere. Many studies have shown that a health-enhancing and inspirational day at school leads to reduced classroom disturbances, increased attention span and learning

motivation, and a generally improved atmosphere [i.a. 7, 25]. The achievement of the objectives as sketched above however proves to be very demanding, and success or failure depends on good qualified teaching staff. Teacher training institutions thus carry a heavy responsibility in respect of the health related instruction and advanced education of teaching staff as well as consulting with schools and education authorities on health topics and projects [14].

Conclusions

Lack of exercise and poor nutrition in children and adolescents are among the major current challenges in the health politics of today: The numbers and facts referenced above underline the corresponding need for action in the context of schools and institutes of higher learning. The development of the health status in this next generation is a cause for genuine and increasing concern, one which must be countered. An on-going health enhancement requires incentives which are timely and appropriate for children. The guidance of growing children towards a healthy nutritional lifestyle as well as enhancing or permanent integration of physical activity into daily routine needs well-qualified teaching staff who, not only just possess expertise, but can also act as competent advisors and role models. At an educational-didactic level, the concern is primarily one of raising awareness and strengthening of the understanding of one's own body. This requires a medium with complete, open and application-oriented access which promotes a positive attitude to health and the personal capacity for action. A lengthy, theoretical exposition and an overemphasized finger-waiving mentality are misplaced. Our schools must be reconfigured into facilities which allow free movement, and health education become an integral part of school culture. Only then will courses of action open up which can advance children's complete development.

In summary, a sustained health education can be shown to:

- Touch all areas of life and fulfill a broad-based spectrum requirement,
- Apply to the realities of life and experience (resources),

¹ E.g. Swiss Internet links: www.gesunde.schulen.ch, www.sge-ssn.ch, www.nutrinet.ch, www.feelok.ch, www.schulebewegt.ch, www.lasuissebouge.ch

- Focus on an integrated health concept and includes all protagonists,
- Be open to active general participation,
- Be based on an applied and flexibility-oriented learning atmosphere,
- Sensitize, motivate and promote individual responsibility,
- Present a quality control criterion for a modern school and higher education facility.

BIBLIOGRAPHY

1. Alexander L.M., Inchley J., Todd J., Currie D., Cooper A.R., Currie C. (2005). The broader impact of walking to school among adolescents. Seven day accelerometers based study. *BMJ*, 331: 1061–1062.
2. Birch L.L., Davison K.K. (2001). Family environmental factors influencing the developing behavioral controls of food intake and childhood overweight. *Pediatr Clin North Am*, 48: 893–907.
3. Boreham C., Riddoch C. (2001). The physical activity, fitness and health of children. *J Sports Sci*, 19: 915–929.
4. Bös K. (2003). Motorische Leistungsfähigkeit vom Kindern und Jugendlichen. In: Schmidt W., Hartmann-Tews I., Brettschneider W.-D. (Ed.): *Erster Deutscher Kinder- und Jugendsportbericht*, 85–107. Schorndorf: Hofmann.
5. Brettschneider W.-D., Naul R., Bünnemann A. & Hofmann D. (2006) Übergewicht und Adipositas bei Kindern und Jugendlichen. *Ernährungsverhalten, Medienkonsum und körperliche (In-)Aktivität im europäischen Vergleich*. *Spectrum Sportwissenschaften*, 18: 25–45.
6. Cooper A.R., Andersen L., Wedderkopp N., Page A., Froberg K. (2005). Physical Activity Levels of Children Who Walk, Cycle, or Are Driven to School. *Am J Prev Med*, 29: 179–184.
7. Dordel S., Breithecker D. (2003). Bewegte Schule als Chance einer Förderung der Lern- und Leistungsfähigkeit. *Haltung und Bewegung*, 23: 5–15.
8. Graf C., Dordel S., Reinher T. (2006). *Bewegungsmangel und Fehlernährung bei Kindern und Jugendlichen*. Köln: Deutscher Ärzte Verlag.
9. Janssen I., Katzmarzyk P.T., Boyce W.F., Vereecken C., Mulvihill C., Roberts C., Currie C., Pickett W. and The Health Behaviour in School-Aged Children Obesity Working Group (2005.) Comparison of overweight and obesity prevalence in school-aged youth from 34 countries and their relationships with physical activity and dietary patterns. *Obes Rev*, 6: 123–132.
10. Janz K.F., Dawson J.D., Mahoney L.T. (2000). Tracking physical fitness and physical activity from childhood to adolescence: The Muscatine study. *Med Sci Sports Exerc*, 32: 1250–1257.
11. Kersting M. (2006). Entstehung von Übergewicht und Adipositas. Ursachen, Hintergründe und Folgen. Einfluss der Ernährung. In: Graf C., Dordel S. Reinher T. (Ed.): *Bewegungsmangel und Fehlernährung bei Kindern und Jugendlichen*, 21–38. Köln: Deutscher Ärzte Verlag.
12. Ketelhut K., Mohasseb I., Gericke C.A., Scheffler C., Ketelhut R.G. (2005). Verbesserung der Motorik und des kardiovaskulären Risikos durch Sport im frühen Kindesalter. *Deutsches Ärzteblatt*, 102: 1128–1136.
13. Kickbusch I. (2006). *Die Gesundheitsgesellschaft. Megatrends und deren Konsequenzen für Politik und Gesellschaft*. Hamburg: Verlag für Gesundheitsförderung.
14. Kühnis J. (2009). Trends im Bewegungs- und Gesundheitsstatus von Schulkindern und deren Implikation für die Lehrer-/Innenbildung. In: *Pädagogische Hochschule Wien (Ed.) Neue Architekturen im europäischen Hochschulraum*, 189–197. Wien: LIT Verlag.
15. Morris J.N., Hardmann A.E. (1997). Walking to health. *Sports Med*, 23: 306–332.
16. Nicklas T.A., Yang S.J., Baranowski T., Zakeri I., Berenson G. (2003). Eating patterns and obesity in children: the Bogalusa Heart Study. *Am J Prev Med*, 25: 9–16.
17. Pietiläinen K., Kaprio J., Borg P., Plasqui G., Yki-Järvinen H., Kujala U., Rose, R., Westerterp K., Rissanen A. (2008). Physical inactivity and obesity: a vicious circle. *Obesity*, 16: 409–414.
18. Prentice A.M., Jebb S.A. (2003). Fast foods, energy density and obesity: a possible mechanistic link. *Obes Rev*, 4: 187–194.
19. Sallis J.F., Prochaska J., Taylor W. (2000). A review of correlates of physical activity of children and adolescents. *Med Sci Sports Exerc*, 32: 963–975.
20. Singh A.S., Mulder C., Twisk J.W.R., van Mechelen W., Chinapaw M.J.M. (2008). Tracking of childhood overweight into adulthood: a systematic review of the literature. *IASO, Obes Rev*, 9: 474–488.
21. Speiser P.W., Rudolf M.C.J., Anhalt H., Camacho-Hubner C., Chiarelli F., Eliakim A., Freemark M., Gruters A., Herskovitz E., Iughetti L., Kurde H., Latzer Y., Lustig R.H., Pescovitz O.H., Pinhas-Hamiel O., Rogol A.D., Shalitin S., Sultan C., Stein D., Vardi P., Werther G.A., Zadik Z., Zuckerman-Levin N., Hochberg Z., (2005). Consensus Statement: Childhood Obesity. *J Clin Endocrinol Metab*, 90: 1871–1887.
22. Strong W.B., Malina R.M., Blimkie C.J.R., Daniels S.R., Dishman R.K., Gutin B., Hergenroeder A.C., Must A., Nixon P.A., Pivarnik J.M., Rowland T., Trost S., Trudeau F. (2005). Evidence based physical activity for school-age youth. *J Pediatr*, 146: 732–737.

23. Twisk J.W.R. (2001). Physical Activity Guidelines for Children and Adolescents – A Critical Review. *Sports Med*, 31: 617–627.
24. Verstraete S.J., Cardon G.M., De Clerq D.L., De Bourdeaudhuij I.M. (2007). A comprehensive physical activity promotion programme at elementary school: the effects on physical activity, physical fitness and psychosocial correlates of physical activity. *Pub Health Nutr*, 10: 477–484.
25. Wamser P., Leyk D. (2003). Einfluss von Sport und Bewegung auf Konzentration und Aufmerksamkeit: Effekte eines „Bewegten Unterrichts“ im Schulalltag. *Sportunterricht*, 52: 108–113.
26. Wang Y. (2001). Cross-national comparison of childhood obesity: the epidemic and the relationship between obesity and socioeconomic status. *Int J Epidemiol*, 30: 1129–1136.
27. Wang Y., Lobstein T. (2006). Worldwide trends in childhood overweight and obesity. *Int J Pediatr Obes*, 1: 11–25.

Received: December 2009

Accepted: February 2010

Published: March 2010

Correspondence

Prof. Dr. Jürgen Kühnis
Pädagogische Hochschule Zentralschweiz
PHZ Schwyz, CH-6410 Goldau
juergen.kuehnis@phz.ch

The Polish Physical Education in Scientific Theory and School Practice – the European Context

Tomasz Frołowicz

Akademia Wychowania Fizycznego i Sportu w Gdańsku
(Academy of Physical Education and Sport in Gdansk, Poland)

Abstract

A theoretical backup for school physical education in Poland are beliefs that this domain of education both contributes to stimulation of somatic and motor development of children and teenagers, and prepares them for physical activity justified by health or sport reasons after completing education.

Against a background of Europe physical education in Poland looks good. During last several years the number of obligatory hours of physical education in schools was almost doubled and infrastructure used for the needs of physical education in schools was significantly improved. Binding physical education program basis for all types of schools includes specification of detailed requirements that each Polish pupil who completes successive stage of education should deal with. Requirements concern mainly health, relaxation and sport.

Indicators of the quality of physical education in Poland are: pupils activity during classes, pupils competences, presence of physical education issues in different aspects of school life, popularization of physical and health activity examples in local environment as well as material standard of physical education. The Polish educational system assumes both external and internal schools procedures of evaluation and quality stimulation of physical education. Among specialists in the scope of physical education in Poland there is a general agreement that the best indicator of this educational domain efficiency is the lifestyle of people after completing schools. Results of researches indicate that an average adult Pole is still insufficiently physically active, and his/her physical form does not fulfill health needs. That is why from this perspective – development needs of children and teenagers as well as physical form and the lifestyle of adults – changes that still occur within the model of school physical education in Poland should be observed.

Key words: school, physical education.

Introduction

„No education without physical education” – the aforesaid catchword was the leitmotiv of European specialists in the domain of physical education [23]. A catchword like that can be considered as a demonstration of a belief that it is impossible to undermine the role of physical education among various educational domains. On the other hand, however, raising the question of inalienability of physical education can be a reflection of fear experienced by representatives of the above mentioned environment, of its future. The latter eventuality is substantiated by the fact that nowadays not many European countries meet quantitative standards of physical education as determined in the Madrid Declaration [23].

On the aforesaid background the situation of physical education in Poland seems to look good, though school practice still does not satisfy expectancies formulated by scientific environments and expressed in documents regulating educational processes throughout the country. The number of mandatory hours of physical education in schools has nearly been doubled over

the last several years and the political transformation contributed to improvement of infrastructure used in schools for the sake of school physical education. The importance of physical education in Poland is additionally stabilized by the regulation concerning the number of mandatory physical education hours. Any possible change in this regard is solely possible on the basis of a decision of Parliament of the Republic of Poland – whereas an independent decision of educational authorities will not be sufficient. In this respect Poland is an exception against other European countries.

The essence of physical education in the Polish way

Many educators have frequently speculated upon how much education there is in physical education, simultaneously confirming the thesis of M. Demel stating that „the pupil’s body is a nuisance of education” [5, p. 3]. Authors tracing changing concepts regarding the essence of physical education indicate that this domain

of education was originally associated with tasks related to supporting biological development of a human being [5, 11, 17]. The aforesaid view was promoted by J. Śniadecki who, at the beginning of the 19th century, when writing about physical education, used to state: „And so I will be wondering and speculating upon how to educate a child in order to – to the largest extent possible – develop its body, release, develop, upgrade and improve its bodily strengths and powers as well as to strengthen and protect its health” [29, p. 9 – the first edition: 1840]. The above mentioned view had been shared by continuators of his idea until Z. Gilewicz, in the first half of the 19th century, limited specific tasks of physical education to stimulating, adapting, compensating and correcting physical development of a human being. Admittedly he indicated some not body-related purposes as well, e.g. socialization, but these were classified as nonspecific tasks of a physical education teacher [9]. By the aforesaid he contributed to ordering the purposes of physical education, though the manner in which he did so entailed creation of – at the most – a quasieducational model of physical education [11].

If we were to agree that physical education is a kind of biotechnology (steering of a biological development) of a human being, it would be possible to prove that purposes of physical education understood in such a way have no educational character, as they can be achieved beyond any educational processes, e.g. increase of muscle mass and strength can be achieved by means of electromyostimulation [17]. Limiting the tasks of physical education to biotechnology confirmed educators in the belief that the only common feature of physical education and education is the name and additionally it reduced the activity of a physical education teacher to a question of minor importance in terms of educational interest.

Separation of physical education from the main trend of education sciences was terminated owing to a paradigmatic revolution called ‘re-educationalization’ by its author [5]. It is worth mentioning that re-educationalization of physical education took place, among other reasons, due to the inspiring power of ideas sometimes formulated in distant past and besides beyond the environment originally related to physical educa-

tion [20 – the first edition: 1787; 39 – the first edition: 1930]. It is worth knowing that a similar change in understanding the essence of physical education also took place in other countries [27, after: 2]. It suggests a certain objectivity of the process in question. Finally, it is worth remembering that this paradigmatic transformation was necessary with regard to possibility of comprehending social and psychological processes conditioning the efficiency of physical education. Furthermore, it contributed to a certain change in defining the purposes of physical education. Environmental and humanistic knowledge collected within the framework of sciences concerning physical education has made it possible to formulate several theses according to which:

- „it is not possible to catch up on negligence, in the stimulation of physical development in youth,
- even an intensive physical training in youth does not guarantee physical fitness in further period of life,
- absolute physical fitness and body efficiency are not factors determining permanence of physical education effects (as a result of body training) but attitude towards body and its needs (as a result of influence on personality)” [11, p. 68].

The above mentioned theses led to an ascertainment that physical education must contain both interim body shaping and forming personality caring of the body [11]. It allowed for changing the original formula of „training the body” for „person’s education in relation to the issues of the body” [5, p. 26]. When biological categories e.g.: health, fitness, efficiency for psycho-social-educational categories e.g. attitude, knowledge, personality were finally successfully converted, a model of physical education that fully respected educational character of physical education, not excluding biological achievements, was created (Figure 1). In accordance with this model purposes of physical education were directed at personality of a pupil with an intention of preparing the pupil to taking care of the body throughout whole his/her life [11].

In this model duplication of activities of physical education teacher was exposed. It was indicated that the teacher conducts physical education – education on the body and physical educa-

tion – mainly shaping the body [11]. This depiction complicated tasks of the teacher. On one hand the teacher must follow communicational rationality in interactions with pupils, out of concern for individualistic results of physical education. On the other hand – when trying to achieve somatic-motoric purposes, the teacher must comply with correctness characteristic for instru-

mental activities. The teacher should also remember that improvement of instrumental activity – biotechnology in this case – does not automatically influence improvement of communicational effect – educational in this case [12] and in some cases both types of effect may even collide with each other [11].

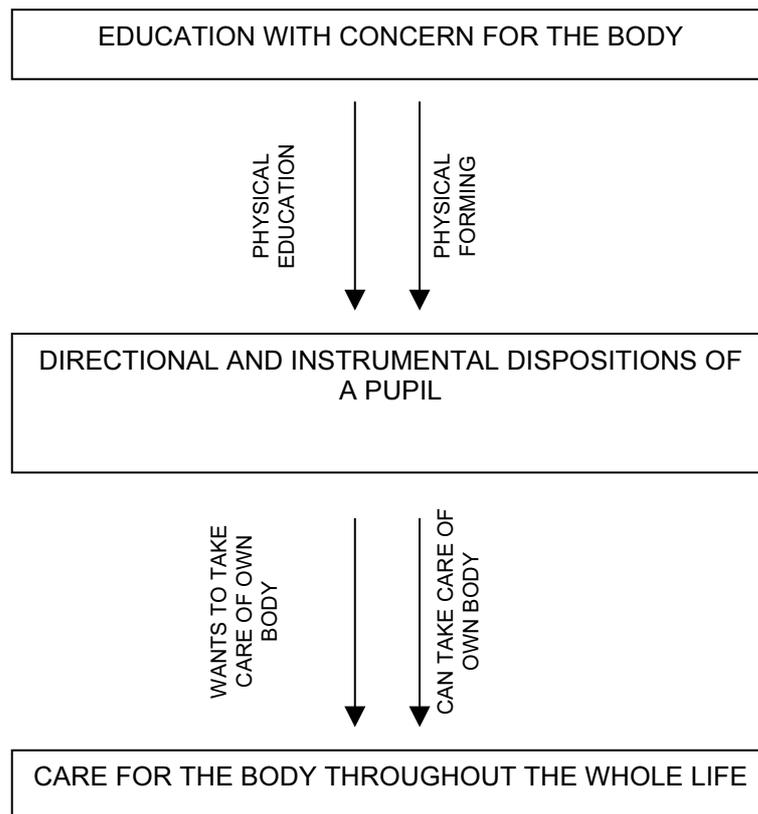


Figure 1. The model of physical education as „educating a person in relation to body issues” – own study, T. Frolowicz [7]

The consequence of re-education of physical education was formulating postulates which determine directions of its modernization: permanent education, prospection, auto education, intellectualization, humanization and individualization [4].

Further development of physical education theory was connected i.a. with development of cultural competence concept as an individualistic result of physical education and with implementation of social-regulating concept of a culture [19]. A. Pawluccki assumed that competences such as axiological, communicational, technological, realizational decide on reasonableness and efficacy of human being activities.

Also the quality of human being activities against the body depends on apprehension of a meaning of this type of treatments (axiological competence), knowledge of their content (communicational competence), knowledge on the ways of activity (technological competence), as well as abilities and efficiency that would allow to change over from intention to actions (realization competence). As a consequence of this type of comprehension, there appeared an expectation that the physical education teacher would contribute to development of various competences of pupils. The fact that also in other countries when determining purposes of physical education, the concept of competence is used shows accuracy

of such a way of determining effects of physical education [3, after: 30]. It also earned followers in Poland [11].

On the other hand using social-regulation concept of the culture to describe a phenomenon of physical activity allowed to fulfill purposes addressed to personality (competence) of pupils with content concerning health, active relaxation, beauty and sport [19]. It was the consequence of assuming a thesis that each person takes care of the body-value for many reasons, among which the most important ones are: vital (e.g. health activity), utilitarian (e.g. recreation), flexible (e.g. taking care for beauty and dance) and agonist reasons (e.g. sport). Taking those four areas of cultural activity of human being into consideration by physical education teacher, as well as directing actions at personality of a pupil causes that the purpose of teacher's work is supporting development of health personality (health cultural

competence), recreational personality (recreational cultural competence), dance personality (esthetic-dance cultural competence) and sport personality (sport cultural competence). Actions of the teacher directed this way make school physical education comprehensive preparation of pupils to participate in physical activity, both in its existential (health and relaxation) and symbolic (dance and sport) areas.

This type of thinking led to creation of „education to the value of the body” model [19]. In accordance with this model the teacher supports development of cultural competences of a pupil, which concerns health, recreation, sport and dance activities with the purpose of helping the pupil to grow up to subjective participation in varied symptoms of practical body training – Figure 2.

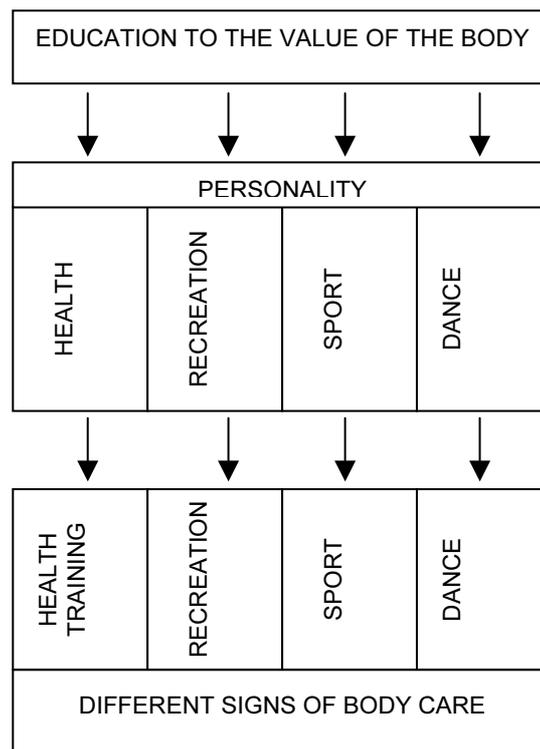


Figure 2. Model of physical education as „education to the value of the body” – own study, T. Frołowicz [7]

As I have already mentioned, a maneuver of re-education did not lead to rejection of previous science works on physical education. It entailed – according to M. Demel – complementary depiction of achievement of consecutive versions of physical education theory [5]. This way each

consecutive physical education model contained also previous purposes of this education domain because „the last of the above mentioned idea does not deny the meaning and possibilities of physical education in the scope of casual body development in the form of shaping physical and

motor fitness as well as forming pro-social attitudes in the course of this process but it constitutes significant supplement of purposes of this domain of education with forming *pro-somatic*

attitudes, as indispensable condition of later participation in physical activity” [11, p. 65] – Figure 3.

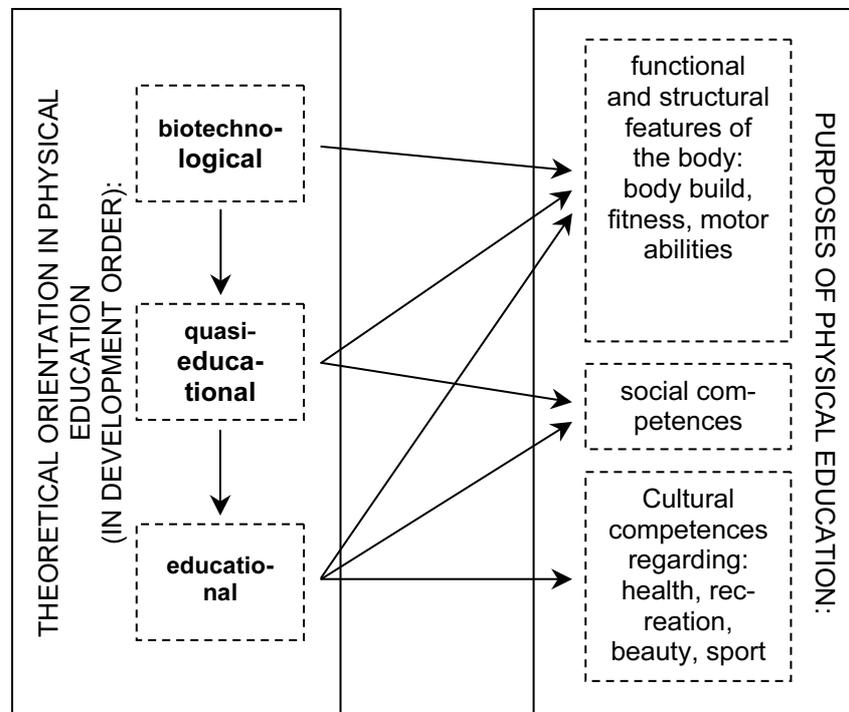


Figure 3. Purposes of physical education in the light of different theoretical orientations in physical education – own study, T. Frołowicz [7]

In the light of the newly adopted model the physical education teacher is not only an instructor of physical exercises. The teacher is an educator, fluent in pupils personal development issues. At teacher’s work the teacher uses both biological knowledge, which allows for supporting somatic and motor development of pupils and psycho-socio-educational knowledge. The second type of knowledge is indispensable in organizing activity, not only physical, but also cognitive and emotional for pupils in the way to favour comprehension of health, recreation, dance and sport values. Changes of subjective level of teachers’ techniques revolutionize its objective realm, which „nowadays consists not only of fitness tools and accessories but also [...] the whole arsenal which serves intellectualization” [5, p. 29–30] in the form of books, films, boards etc. of didactic means.

The Polish pattern of physical education

Following the changes of comprehension of physical education essence, the Polish model of physical education in schools has also been changing. It was reflected in documents, which regulated a course of educational practice. Until the second part of the 1990s there was unified, centrally established educational program regarding domains of school education in Polish schools. There were detailed analysis of consecutive editions of programs [2, 13, 15]. In consecutive editions of physical education programs both purposes concerning improvement and education were emphasized, although proportions between them were different. It is worth to underline that actually in all physical education programs elaborated after the II World War there were purposes connected with „creating and strengthening passion (habits) for move, sport and tourism, hygienic lifestyle” and with „obtaining basic knowledge on influence of exercises on the body and psyche, on purposes and tasks

of physical activity in the life of human being” [2, p. 47]. However, detailed analysis of physical education programs obligatory in Polish schools until transformation of political system, conducted by M. Bukowiec [2] authorized him to state that only the program as of 1985 took into consideration all postulates regarding physical education by M. Demel in 1973.

The breakthrough moment for the way of regulation of school practice by central educational authorities was a program and structural reform of educational system in Poland, which started in 1999 and was continued in 2009. Educational programs prepared by teachers and experts from outside of educational administration were made possible to be used in schools. Only legislation procedures of those documents were defined in schools which expected control of educational programs with regard to their compliance with centrally approved program base of general education. This way relative uniformity of educational experience in Poland was tried to be ensured, not limiting freedom of teachers and schools at the same time. With regard to physical education it was in accordance with conclusions of previous researches: „a school should be given a wide scope of authorizations when it comes to choosing the content of physical education” [14, p. 204].

Freedom of creating educational programs by teachers introduced in 1999 fructified the beginning of numerous proposals for each domain of education at schools, and even though the number of physical education programs which in the period of 1999–2008 obtained approval of the Ministry of National Education, in comparison with other subjects in schools was not very impressive, it exceeded thirty (data from the Ministry of National Education). In 2009 the Ministry of National Education resigned from controlling compliance of educational programs with the general education programs basis, passing the possibility of decisions and at the same time responsibility at this point to directors of schools.

After experience of the reform in 1999, another general education program basis [21] was written most of all as specification of educational requirements, with which each normally developing pupil of Polish school should deal with at the end of each stage of education. Thanks to that

education program in Poland was adjusted to the needs of the European Qualification Framework, in accordance with the recommendation of the European Parliament as of 23rd April 2008 on setting European Qualification Framework for education throughout the whole life [21].

The basis of physical education program defines purposes of education and detailed requirements for four stages of education:

- the first stage of education covers the first part of primary school and lasts three years (children at the age from 7 until 10 years old),
- the second stage of education covers the second part of primary school and lasts three years (children at the age from 10 until 13 years old),
- the third stage of education covers gymnasium and lasts three years (teenagers at the age from 13 until 16 years old),
- the fourth stage of education covers secondary school and lasts three or four (more rarely) years (teenagers at the age from 16 until 19 or 20 years old).

In 2009 the process of decreasing the age of pupils who start education at school, keeping at the same time 12-year period of general education started. In 2012 this process will be finally finished and all children at the age of six will begin school education. As the consequence in the perspective of next several years there will be decrease of the age (18 years old) when pupils finish the general education in 3-year secondary school.

Purposes of physical education written in the program basis are formulated as follows:

I stage of education, i.a.: supporting a child in intellectual, emotional, social, ethical, physical and esthetic development,

II stage of education: safe participation in physical activity of recreation and sport character with comprehension of its meaning for health:

- 1) participation in physical activity directed at health, rest and sport,
- 2) obeying safety regulations during physical activity,
- 3) recognizing own physical activity and fitness, as well as practicing pro-health behaviour,

III stage of education: concern for physical activity, correct development, physical, psychical and

social health as well as comprehension of connection between physical activity and health, in particular:

- 1) ability to evaluate own fitness and course of physical development in puberty,
- 2) readiness to participate recreation and sport form of physical activity and organizing them,
- 3) comprehension of connection between physical activity and health,
- 4) personal and social abilities favorable to health and safety,

IV stage of education: preparation to physical activity throughout the whole life as well as protection and improvement of own and other's health, in particular:

- 1) realizing the need of physical activity throughout the whole life,
- 2) following the regulations of pro-health lifestyle in everyday life,
- 3) acting as critical consumer (recipient) of sport,
- 4) abilities favorable to preventing diseases and improving physical, psychical and social health.

Detailed requirements in the scope of physical education in the program basis were grouped in seven subjects:

- diagnosis of fitness and physical activity and physical development,
- health training,
- sports throughout the whole life and relaxation,
- safe physical activity and personal hygiene,
- sport,
- dance,
- health education.

The structure of detailed requirements is of spiral character; during consecutive stages there is new content which pupils have met before, however the level of difficulty of requirements is higher. There were also accepted regulations that all requirements from previous levels are obligatory on the consecutive level of education, and that requirements from the consecutive levels may not be formulated for pupils on earlier stages.

Later, example detailed requirements for next stages of education were presented, designed in two subjects: „diagnosis of physical fitness and activity and physical development”

and „sports throughout the whole life and relaxation”.

Diagnosis of physical fitness and activity and physical development:

I stage of education, a pupil:

- performs marching-walking that lasts at least 15 minutes,
- is able to perform attempt of strength of abs and attempt of nimbleness of lower part of spine,

II stage of education, a pupil:

- performs marching-running Cooper test without stopping,
- performs attempts of fitness that allow to evaluate oxygen endurance, posture strength of muscles, nimbleness of lower part of spine and with the help of a teacher a pupil interprets obtained results,
- performs measurements of height and weight and with the help of a teacher a pupil interprets obtained results,
- evaluates own posture of the body,

III stage of education, a pupil:

- performs set of attempts due to evaluate endurance, strength and nimbleness, chosen by the pupil,
- evaluation of own physical activity,
- explains changes in body build and fitness in puberty,
- names reasons and results of obesity as well as unjustified dieting and using steroids with the purpose of increasing muscles mass,

IV stage of education, a pupil:

- points out strengths and weaknesses of pupil's fitness,
- elaborates and realizes the program of physical activity adjusted to own needs,
- discusses recommendations concerning physical activity depending on sex, the stage of life and type of occupation,
- names factors that influence taking up physical activity depending on family, friends, media and local society,

Sports throughout the whole life and relaxation

I stage of education, a pupil:

- uses a ball: throws, catches, dribbles, returns and leads it,
- rides, e.g. a bicycle, roller skates; obeys the rules regarding moving on roads,

- takes parts in games, minigames and field games, sport competitions, following regulations and subordinating to decisions of a referee,
- knows how to behave when winning and is able to deal with failures within bounds of abilities;

II stage of education, a pupil:

- organizes within the circle of pupils of the same age plays, motor and recreation games, following simplified regulations,
- uses in the game: dribbling a ball when running and changing the direction of the ball, leading the ball when running and changing the direction of the ball, passing the ball with both and one hand, throwing the ball to a basket, a throw and shot of the ball to the goal, returning the ball with both hands in upper way,
- discusses regulations of active relaxation,

III stage of education, a pupil:

- uses in the game: returning the ball with both hands in lower way, serve, forehand and backhand, competition,
- sets correctly on a field in offence and defence,
- names places, buildings and tools in the neighborhood which might be used for physical activity.

IV stage of education, a pupil:

- uses elements of technique and tactics in selected individual and team forms of physical activity.

Detailed requirements were written in the form of tasks, that each normally developing pupil should deal with at the end of a stage of education. The structure of program basis, of which the substance is specification of detailed requirements gives the opportunity of developing evaluation of teacher's work effects procedures. For the first time for many years effects of physical education teachers' work may be controlled in accordance with procedures similar to those, which are used with reference to teachers of different subject specialty. A need of this kind was indicated in results of previous evaluation of effectiveness of physical education: „it is indispensable to elaborate and consequently use unified criteria and regulations of pupils and teachers' work results evaluation in the

whole educational system in the scope of physical education" [14, p. 204].

Results of international researches of pupils' abilities, conducted in the countries associated in OECD indicate that structural and program reform of general education, which started in Poland in 1999 contributed to improvement of effectiveness of Polish educational system [6, 24]. However, it must be remembered that program reforms may not be treated as direct reasons of education quality improvement, including physical education, because the fact of changes in educational program is only the beginning of the whole chain of events and at the end of that there is efficient education.

Changes regarding organization of physical education in Polish schools accompany program reforms of physical education in Poland. Thanks to them schools obtain more organizational self-government, which allow for realization of physical education in the way that fulfills varied needs of pupils to the highest extend. It is supposed to lead to better usage of a high number of obligatory hours of physical education, against the situation in most European countries [23]:

- three hours per week during the first stage of education,
- four hours per week during the second and third stage of education,
- three hours per week during the fourth stage of education.

Since 2003 directors of schools in Poland, starting from the second stage of education are obliged to present to pupils the offer of physical education classes to choose. The possibility of planning a part of obligatory hours of physical education in the form of extra classes is a support for realization of the above mentioned obligation. Since 2009 this possibility concerns now half (two out of four) of hours of obligatory hours of physical education at primary school and gymnasium and over half (two out of three) hours in secondary school. Actions taken by school in this scope should provide better conditions for realization of basic purposes of physical education, i.e. developing readiness of pupils to take up physical activity out of health, recreational, sport, dance character. This type of organizational solution may be treated as the result

of revolution of the model proposed a quarter of century ago by M. Demel [4].

A significant model of physical education in Polish schools are regulations regarding evaluation of pupils' achievements. With regard to specific character of physical education, separate law regulations concerning the subject and criteria of evaluation of a pupil are provided. This procedure results most of all from comprehension of social and psychical mechanism which is started by the teacher in connection with supporting the readiness of pupils to take up physical activity. Pupil's readiness is to a large extent dependent on pupil's belief that the physical activity which the pupil has taken up would bring satisfactory effects, while teacher's task is i.a. supporting development of this confidence. Competently used school evaluation is one of available tools. In the Polish educational system the basic object of physical education evaluation is pupil's effort put in completing duties that result from the specific character of the subject. In school practice physical education teachers have problems with defining their requirements in such way, so that those requirements are clear for pupils and would motivate pupils to intensified activity during obligatory and non-obligatory classes. In accordance with binding regulations there is no possibility to formulate marks at schools on the basis of results of motor tests e.g.: endurance, strength, speed. Despite this fact, numerous physical education teachers still acknowledge that the level or progress of development of motor abilities is one of the most important issues of physical education evaluation of the pupil.

The pupil is not the only subject of educational processes which is subjected to evaluation. From the perspective of educational system evaluation of teacher's work is also significant (teacher as a person) and school functioning (as an institution). With regard to this fact the Polish model of education provides procedures on supporting teacher's activity, controlling teacher's work and evaluation of teacher's effects. The person who acts educational supervision over the Director of a school is a Super Intendent, i.e. the person managing local educational authority on the level of a voivodship. The Super Intendent's task is to support and control the work

of educational institutions. The Super Intendent performs his/her functions by using specialized employees of public administration – inspectors. In Poland the specialization of inspectors does not concern domains of education, but only types of schools. However, the Director of a school performs a direct supervision over the work of teachers, including physical education teachers. Central, unified procedure for the whole country on evaluation of pupils' learning effects are so called external exams, that pupils at the end of the second (test), the third (exam) and the fourth (maturity exam) stage of education participate. However, those procedures do not include educational evaluation of achievements in terms of physical education.

Despite the lack of central procedures concerning evaluation of effects of physical education teacher's work in Poland, the problem of quality of physical education in schools is noticed by both educational administration and scientific environment. Within the framework of „The Strategy of sport development by 2012” tasks concerning evaluation of effects of physical education in schools were provided. In the period of 2003 and 2004 numerous discussions with participation of representatives of different scientific environments took place and the effect of those discussions was determining indicators of quality of physical education in schools and methods of their evaluation [8]. The following factors determine the quality of physical education in schools:

- 1/ activity of pupils – in order to perform evaluation of pupils' activity within the framework of obligatory and non-obligatory classes, organized or co-organized by the school, the following information should be collected:
 - real participation of pupils in obligatory classes of physical education as well as real reasons of absence,
 - real participation of pupils in non-obligatory classes of physical education, including generality and periodicity of participation of children and teenagers in recreation, tourist and sport events, organized or co-organized by the school,
 - the number of pupils qualified to corrective gymnastics, as well as the number of children taking part in this type of classes,

2/ competence of pupils (educational and development achievements of pupils) – in order to perform evaluation of competence of pupils, as the result of pupils' participation in physical education at school, the following information should be collected:

- level and progress of abilities resulting from program requirements,
- level and progress of knowledge of pupils resulting from program requirements,
- pupils' fitness, especially development of those abilities which prove the strongest connection with health potential,
- effectiveness of corrective gymnastics conducted in the school,

3/ presence of physical education issues in different aspects of school life – in order to perform evaluation of this quality indicator, the following information should be collected:

- educational programs at schools,
- functioning of health and physical activity oriented associations, organizations, circles etc. in schools,
- functioning of subject team of physical education teachers,
- mid-lesson exercises and stimulation of pupils' activity between lessons,
- presence of health and physical activity issues in school media,

4/ spreading patterns of physical and health education in local environment – in order to perform evaluation of efficiency of spreading the value of physical and health education in local environment by the school, the following information should be collected:

- cooperation with parents on issues concerning health, healthy lifestyle, including physical activity of children and teenagers,
- organization by the school or on school's initiative events promoting health and physical activity values in local environment,

5/ material standard of physical education – in order to perform evaluation of this quality indicator, the following information should be collected:

- state of infrastructure used by the school for the needs of physical education at schools as well as actions taken up aiming at its development,
- efficiency of using infrastructure.

Presented indicators were put in order in hierarchical way – especially the first two are of significant meaning for evaluation of physical education quality in schools. Previous procedures elaborated locally exposed educational and development achievements of pupils, not noticing at the same time the importance of children and teenager activity within the framework of physical education classes.

School reality

Functioning of the school is of a special interest in society. This topic is eagerly discussed, but in most cases the conclusion is that functioning of schools does not meet the expectations. This is also a specific character of scientific works regarding schools. There are two kinds of texts regarding schools: „hyper-critical” evaluation of schools' work and „excessive” expectations. It causes the occurrence of normative overload with regard to educational institutions and teachers. As the consequence, the school is reluctant to reveal its true appearance, what makes it difficult to evaluate its functioning in reliable way [28]. Despite this fact, we have large number of data which allow to evaluate the quality of physical education.

Long-term researches of Z. Pańczyk [18] indicate that physical load during physical education classes is too low to stimulate motor development of children and teenagers. Other researches also confirm this state [1, 2]. If we add common complaint regarding too high number of pupils who avoid participation in obligatory classes of physical education, then it turns out, that a basic indicator of the quality of physical education in Polish schools – activity– is still too low.

Interest of pupils' educational achievements level is common, and the above mentioned researches of PISA confirm this fact. In Poland there were many attempts to evaluate abilities and knowledge of pupils with regard to requirements of physical education programs. Most researches, regardless of research strategy and used measurement tools indicate, that „consecutive editions of obligatory physical education programs have never been and are not completely realized” [14, p. 201]. Researches con-

ducted in other academic centers also corroborate this thesis [10].

Researchers who evaluate a course of motor development of children and teenagers collected significantly extensive work. Although, with regard to personal scale, it is difficult to acknowledge an individual level of physical activity as direct result of participation in physical education at schools, from the perspective of social processes evaluation, an average level of physical activity of children and teenagers causes interest in connection with evaluation of the quality of physical education in schools. Researches that started in the first half of 20th century and continued by researchers until now concerning the physical condition of Polish population at school age are worth mentioning [25, 26]. It results from those researches, that there is occurrence of rapid somatic development of teenagers, and the motor development does not follow it. However, those development disproportions are not directly connected with efficiency of physical education in schools, noticing civilization

changes and personal and environmental conditioning as reasons.

Conclusion

There is a common agreement in Poland that the best measuring indicator of the quality of physical education in schools is the lifestyle of people after completing education. Results of research indicate that an average adult Pole is still insufficiently physically active and his/her physical condition, e.g. efficiency and relative slimness of the body does not fulfill his/her health needs [16]. Although differences in physical condition if Polish society may not be explained only with differences of the quality of physical education in schools, there are hopes in this matter connected with education at schools. So from this perspective – development needs of children and teenagers as well as physical condition and the lifestyle of adults – changes within the model of physical education in schools in Poland should be observed as well as its practical consequence.

BIBLIOGRAPHY

1. Bronikowski M. (2008). Postawy prosomatyczne młodzieży gimnazjalnej jako efekt interwencji edukacyjnej w procesie wychowania fizycznego. Poznań, AWF.
2. Bukowiec M. (1990). Postulowane, założone i rzeczywiste funkcje wychowania fizycznego w przygotowaniu do uczestnictwa w kulturze fizycznej. Kraków, AWF.
3. Crum B. J. (1993). Conventional thought and practice in physical education problems of teaching and implications of change. *Quest*, 45.
4. Demel M. (1973). Szkice krytyczne o kulturze fizycznej. Warszawa, SiT.
5. Demel M. (1989). O trzech wersjach teorii wychowania fizycznego. Próba ujęcia komplementarnego. *Wychowanie Fizyczne i Sport*, 2, p. 3–30.
6. Federowicz M. (2007). Badanie PISA. Umiejętności polskich gimnazjalistów: pomiar, wyniki, zadania testowe z komentarzami. Warszawa, Instytut Filozofii i Socjologii PAN.
7. Frołowicz T. (2002). Edukacyjne intencje nauczycieli wychowania fizycznego – między deklaracjami a działaniami. Wyd. Akademii Wychowania Fizycznego i Sportu, Gdańsk.
8. Frołowicz T., Lewandowski M., Madejski E., Muszkieta R. (2004). Ocena i stymulacja jakości wychowania fizycznego w szkole – propozycje rozwiązań systemowych. In: *Wychowanie i kształcenie w reformowanej szkole*, (Eds.) T. Koszycz, M. Lewandowski, W. Starościanka. Wrocław, WTN, p. 131–137.
9. Gilewicz Z. (1964). Teoria wychowania fizycznego. Warszawa, SiT.
10. Górna K. (2001). Przygotowanie młodzieży do uczestnictwa w kulturze fizycznej. Katowice, AWF.
11. Grabowski H. (1997). Teoria fizycznej edukacji. Warszawa, WSiP.
12. Habermas J. (1983). Teoria i praktyka. Wybór pism. Warszawa, PIW.
13. Jaworski Z. (Ed.) (1973). Program wychowania fizycznego w szkole podstawowej w Polsce w latach 1945–1972. Gdańsk, WSWF.
14. Jaworski Z. (Ed.) (1984). Efekty założone i rzeczywiste szkolnego wychowania fizycznego. Raporty z badań. Warszawa, AWF.
15. Lachowicz L. (Ed.) (1974). Program wychowania fizycznego w szkołach ponadpodstawowych w Polsce w latach 1945–1972. Gdańsk, WSWF.
16. Lewandowski M., Frołowicz T., Resiak M. (2005). Polski model szkolnego wychowania fizycznego wobec wyzwań cywilizacyjnych. *Wychowanie Fizyczne i Zdrowotne*, 8–9, p. 7–12.
17. Osiński W. (1996). Zarys teorii wychowania fizycznego. Poznań, AWF.

18. Pańczyk W. (1999). Biologiczno-zdrowotne i wychowawcze efekty lekcji wychowania fizycznego w terenie i w sali. Zamość, ODN.
19. Pawłucki A. (1992). Wychowanie jako kulturowa rzeczywistość. Na przykładzie wychowania do wartości ciała. Gdańsk, AWF.
20. Piramowicz G. (1958). Powinności nauczyciela oraz wybór mów i listów. Wyd. Ossolineum, Wrocław-Kraków.
21. Podstawa programowa wychowania przedszkolnego oraz kształcenia ogólnego w poszczególnych typach szkół (2008). Rozporządzenie Ministra Edukacji Narodowej z 23 grudnia 2008 r.
22. Pośpiech J., Wojnar J. (1999). Wybrane problemy kształcenia nauczycieli wychowania fizycznego w Europie Zachodniej. In: Wychowanie fizyczne w dobie reformy edukacji, (Eds.) W. Osiński, J. Pośpiech, A. Szecówka. Wrocław, WTN, p. 119–124.
23. Pośpiech J. (2006). Jakość europejskiego wychowania fizycznego w świetle badań. Racibórz, PWSZ.
24. Program Międzynarodowej Oceny Umiejętności Uczniów OECD PISA (Programme for International Student Assessment). Wyniki badania 2006 w Polsce. Warszawa, MEN, ([http:// www.ifispan.waw.pl/ifis/badania/program_pisa/](http://www.ifispan.waw.pl/ifis/badania/program_pisa/)).
25. Przewęda R., Dobosz J. (2003). Kondycja fizyczna polskiej młodzieży. Warszawa, AWF.
26. Przewęda R., Trzeźniowski R. (1989). Sprawność fizyczna polskiej młodzieży w świetle badań z roku 1989. Warszawa, AWF.
27. Singer R. (1976). Physical Education. Foundations, The Florida State University.
28. Schratz M. (1997). Metodologia samoewaluacji. In: Ewaluacja w szkole. Wybór tekstów, (Ed.) H. Mizerek. Olsztyn, Uniwersytet Warmińsko-Mazurski, p. 72–89.
29. Śniadecki J. (1997). O fizycznym wychowaniu dzieci. Gdańsk, AWF.
30. Znaniecki F. (1973). Socjologia wychowania. Vol. II. Urabianie osoby wychowanka. Warszawa, PWN.

Received: December 2009

Accepted: January 2010

Published: March 2010

Correspondence

prof. nadzw. dr hab. Tomasz Frołowicz
Akademia Wychowania Fizycznego i Sportu w Gdańsku
Katedra Wychowania Fizycznego
ul. Kazimierza Górskiego 1
80-336 Gdańsk
t.frołowicz@awf.gda.pl

Effects of an Adapted Aquatics Programme for Children with Angelman Syndrome on the Emotional Dimension: a Qualitative Study

Jaume Cantallops Ramón, Josep Vidal Conti, Pere A. Borràs Rotger, Xavier Ponseti Verdaguer, Pere Palou Sampol

Universitat Illes Balears

(University of Balearic Islands, Physical Activity and Sports Science, Spain)

Abstract

The aim of this research is to prepare and apply an educational aquatic program for multi-disabled pupils of a special education centre that could offer educative resources in order to contribute to a global education and, at the same time, to evaluate benefits. This research is motivated because of the missing researches and experiences about the water as a learning medium for multi-disabled pupils. We have worked with a sample of two Angelman Syndrome participants, between 12 and 14 years old. The information has been compiled from interviews with professionals, sessions recording, and registrations. Results show that the aquatic medium can contribute over emotional development.

Key words: Aquatic medium, Angelman Syndrome, qualitative research, quality of live and emotional development.

Introduction

Historically, aquatic activities for seriously affected persons have been associated practically exclusively with using water as a therapeutic, rehabilitating medium. The aquatic medium can also be a place for learning and, as I. López [17] claims, becomes a space to tackle any educational content, using movement as a learning tool. Moreover, due to its characteristics, it could turn out to be intrinsically motivating, as it involves working in an environment that is totally different from the norm; and persons with motor disabilities – more specifically with Angelman syndrome – can be freed from the supports used to move (walking frames, wheelchairs) and be more autonomous than on land [9]. Thus, not only does this sort of approach aim to affect physical aspects, but also as J. Rosell [24] emphasizes, to affect cognitive and socio-affective aspects to the same extent.

As far as Angelman syndrome is concerned, C. Brun [4] states that it is caused by lack of functioning of certain genes on maternal chromosome 15. It affects 1 in 20,000 or 30,000 newborn, males and females equally, causing important neurological alterations such as severe mental deficiency, serious retardation of motor development, epilepsy, ataxia, sleep disorders

and absence of speech. Furthermore, as other authors also point out [1], persons who have this, have rather a consistent behaviour phenotype: happy appearance, excessive smile, easily excitable personality, hyperactivity and a fascination with water.

Nowadays researches focusing on the benefits that can be provided by the use of adapted aquatics programmes for persons with Angelman syndrome – or, in general, severely affected persons – are practically nonexistent and there is little literature on the subject.

R.A. Rider and S. Modell [23], after carrying out a study on aquatic activities for persons with Angelman syndrome, pointed out how the aquatic medium can be an ideal space not only for the development of physical skills, but also social skills, which can have a positive influence on their psychic maturation. Other experiences, even though they were not aimed at this syndrome, have features that can be identified with an educational line of aquatic activities for persons with motor disabilities. Different examples are shown below:

M. Castillo and J. Palacios [6] and S.A. Peganoff [21] note the importance of elaborating and applying the programme from a multi-

professional, interdisciplinary approach, in order to complement and integrate a medical perspective with an educational one. In this professional group, V. González [10] includes the figure of graduate in the Science of Physical and Sports Activities (*CAFE*) in this team.

E. Botella [2]; T. Moore [19]; J. Vázquez [29] and H.A. Villagra [30] highlight the need to work physical, psychological and relational objectives to the same degree of importance, since a person must be considered as a whole and not be limited to the physical sphere, as maintained in medical research.

A. Ji-Houn et al. [14], in their study, refer to the need to establish different moments within the session (activation, main part and return to calm). In each part the presence of play is fundamental, working as a backdrop to the different tasks and contents, as this is the most essential mode of expression in the life of children, favouring motor, intellectual and socio-affective development [3, 7, 12].

J.A. Jones [15]; D. Salaün et al. [25] emphasize the need to carry out a familiarization work in the medium so as to introduce pupils to water progressively by establishing a climate of confidence between participants and professionals. In order to develop this, in accordance with E. Botella [2]; J.A. Herran [12]; J.A. Jones [15]; T. Moore [19], different auxiliary flotation devices are used; as they can help participants acquire confidence, assurance and carry out actions that would be impossible without them.

The purpose of this study is to elaborate and apply an adapted aquatics programme for children with Angelman syndrome who attend a special education centre, so as to offer a resource that can complement the overall experiences carried out by the participants at the school, and to evaluate the benefits [5].

Method

Participants

The participants were two pupils, a girl of 13 years of age and a boy of 11, both with Angelman syndrome, from the special education centre "*Pinyol Vermell*" (Mallorca). The inclusion criteria were set as the participants were to have

a pool session during the school day that their teacher-tutor could perform the activity together with one of the researchers in the study and that the aquatic medium were to be attractive and motivate the participants.

Material

The research was based on qualitative methodology (case study). A video-recording of each of the twenty-one sessions in the programme and their later transcription were used, as well as interviews with the teacher (one per session) recorded using a voice recorder. Moreover, some record sheets filled in by the tutor were used in order to complete the above information. It is worth noting that at no time did we aim to quantify the data or generalize them, but rather to analyse an experience in a specific context.

Procedure

The application of the programme took place throughout the period between the months of January and June, 2005, during which time we proceeded to develop the twenty-one sessions and compile the information using the tools mentioned in the above section.

Treatment of the information

Conceptual categories were established in order to be able to evaluate how the aquatic programme worked in case of the participants. The categorization was carried out by taking into account the dimensions mentioned by R.L. Schollock [26] to define the quality of life. Out of a total of eight dimensions the research was finally limited to four: physical, emotional, interpersonal relations, autonomy/independence. Sub-dimensions or sub-categories were created for each one, so as to interpret the information obtained from the transcription of the sessions, the interviews and the record sheets. In this case we focus on the emotional dimension, which refers to all the expressions and states of the participants by which they showed how they felt mentally (positively and negatively), and also how they expressed these.

The following classification was carried out:

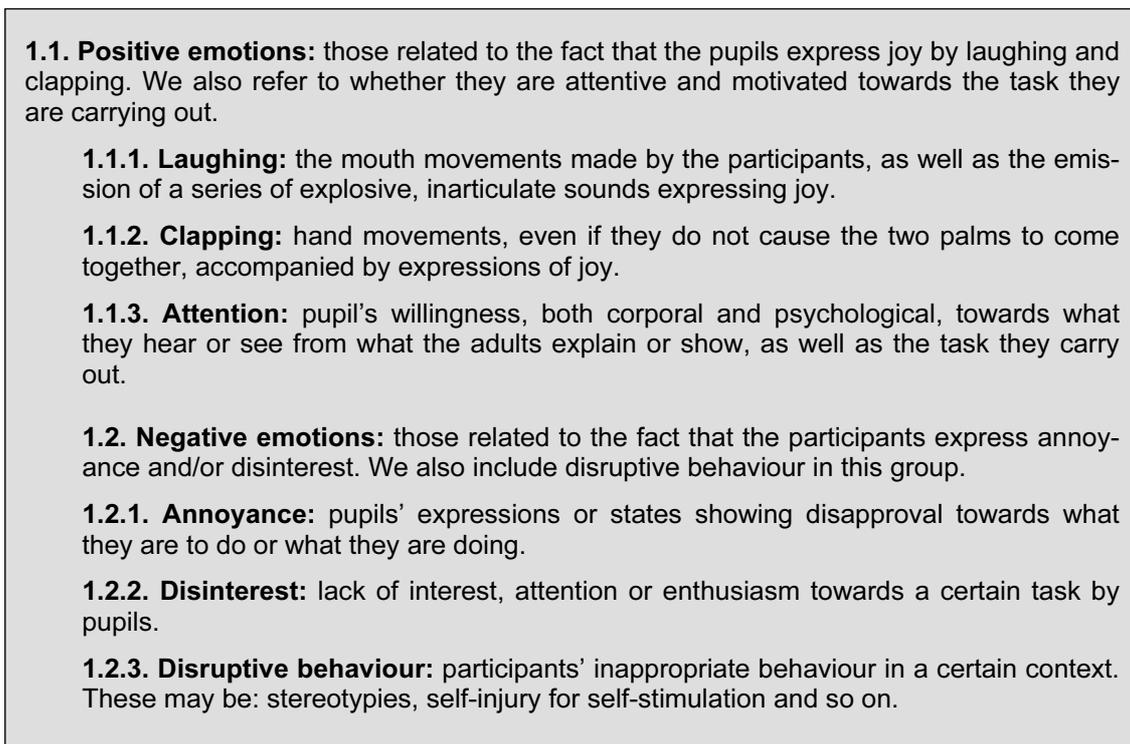


Figure 1. Categories to analyse the emotional dimension [5]

Results

The results are grouped into two figures, which summarize the information analysed from the different information sources mentioned above.

After each figure, some significant examples are given, related to the comments listed in the sub-categories of each figure. They are taken from interviews with the participants' tutor, from descriptions of sessions made using video recordings, or from record sheets in order to have a reference of how the highlighted information was obtained. When "T" is used, it refers to one of the subjects (a boy), when "AM" is used, it refers to one of the subjects (a girl), when "M" is used, it refers to tutor/teacher and when "J" is used, it refers to swimming instructor.

Examples

1.1. Laughing

1.1.1. Interview with tutor, session 13

When we brought the flippers, they had fun. I had fun just seeing AM laughing. You could see that she was enjoying what she saw and that

she understood that they went on her feet. Afterwards, in the water, in the swimming pool, she stretched her feet as if she was swimming, moving her legs. I think it was the session that she has laughed the most so far and found it the most fun.

1.1.2. Tutor's record sheet, session 10

...what she enjoyed most were the balloons with pictures of a clown and putting together the cork pieces. She demonstrated this by laughing, looking satisfied, moving toward the balloon and stretching out her arms to take it.

1.1.3. Interview with tutor, session 13

It was extremely positive, healthy laughter. What's more, she stretched out her feet, taking the flippers from you. This was highly significant, meaning that she was having a wonderful time putting on the flippers and, afterwards in the water, seeing everyone with flippers...seeing that she didn't sink and that she could propel herself with her feet.

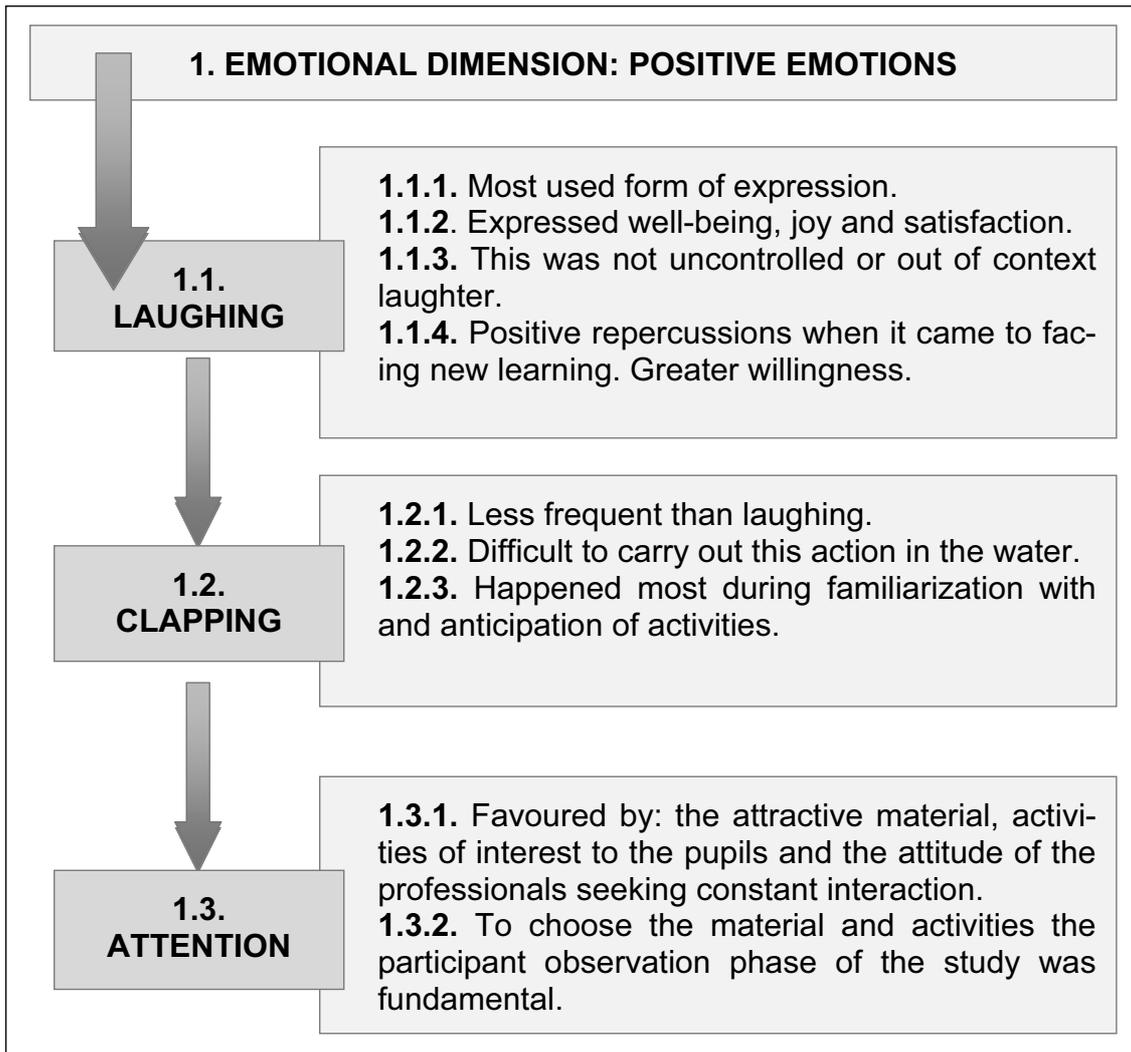


Figure 2. Summary of the results related to positive emotions

1.4. Description of session 8

To end the interactive story, bringing out three coloured balloons, the wizard told the participants that now they would travel to the country of balloons. As soon as the participants saw him, they became very happy and started laughing, particularly AM. T and AM rapidly both began to grab the balloons and hug them.

1.2. Clapping

1.2.1. */1.2.2.:

*It should be noted that the two participants clap to indicate when something pleases them or to show joy for various reasons (because they like to be with someone, they like certain materials, an activity, a type of food etc). In contrast, in the pool, given the position of their bodies, the

use of flotation materials and the presence of water, they find it harder to clap to demonstrate how they feel.

*Even so, this sub-category is mentioned because it has occurred on specific occasions, always during the preparatory part prior to an activity (carried out at the poolside seated on plastic chairs, before being in the water).

1.2.3. Description of session 2

While J was getting the materials ready (some water pistols), M accompanied the participants at the poolside, and at no point did either of the latter stop looking at what J was doing. Suddenly AM saw the water pistols and she became very happy, clapping her hands. She was very motivated.

1.3. Attention

1.3.1. Tutor's record sheet, session 4

The inclusion in this session of an interactive story, featuring a wizard, constituted a big surprise and major source of entertainment. The different activities that the wizard proposed and the different materials were highly motivating. They paid a lot of attention at all times to what he was doing and enjoyed themselves a lot.

1.3.2. Description of session 10

J appeared with a balloon with the face of a clown on it and a panel with different parts of a clown: two eyes, two eyebrows, two ears, a

mouth, a nose, a hat and a neck. These would be put in the pool. The adults emphasized that the clown was laughing and T and AM paid close attention. Then J showed them the completed panel with all the parts of the clown positioned in place, verbally repeating each of the parts that they would have to collect from the water and fit into position.

The participants collected the different parts and put them on the panel until there was none left. Then J got out of the pool to show them the finished panel. The participants looked at it carefully and the activity came to an end (28:12-35:00).

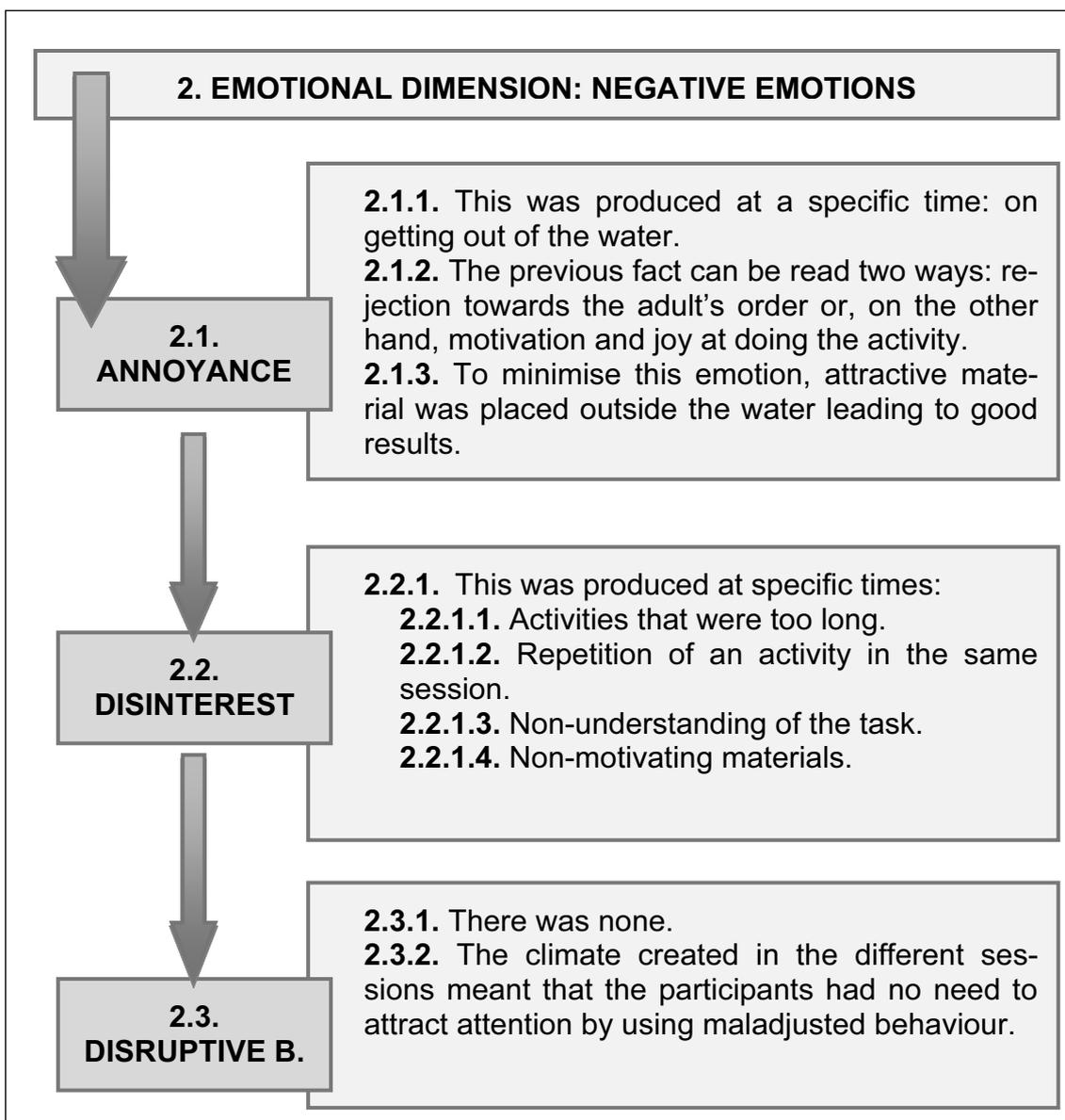


Figure 3. Summary of the results related to negative emotions

Examples

2.1. Annoyance

2.1.1. Description of session 1

They found getting out a bit hard this session. T did not want to get out and M tried to calm him down in the water because then he gets out more easily. Meanwhile, although she found it hard, AM got up the steps out of the pool with the aid of J. She struggled because she did not want to get out and tried to sit down in the water, but finally she collaborated. M then got out with T using the ramp, saying "Now we'll go and have something to eat!"

2.1.2. *

*A dual interpretation can be made of the fact that the participants did not want to get out of the water: a negative one because it shows the participants did not understand that the activity had finished, and a positive one because they did not want to get out since they were enjoying the activities from the programme.

2.1.3. Interview with tutor, session 2

I think that... having to go and burst the balloon to get out of the pool was ideal, always seeking some kind of stimulus to finish the activity that encourages them to get out. T was delighted to get out like that. He got out the first time round... During that session it worked out very well. The idea of bursting the balloon was perfect.

2.2. Disinterest

2.2.1. This occurred in the following situations:

2.2.1.1./2.2.1.2. Description of session 10

The participants performed the activity. As time went by, both T and AM began to get more tired and they found it harder to concentrate on what they were doing. As a result, when three photos were left to go, J got them out of the water in order to start the next activity and that one came to an end (07:28-16:36).

2.2.1.3. Description of session 5

J brought the whistle in again and demonstrated how to blow into it. He told T and AM that they had to come toward the adults if they

wanted to blow into the whistle and that they had to move their arms and legs to get there. M and J each had a whistle and they blew into them to make the participants come and get the whistles and use them. The participants moved very well, almost all round the pool, but they did not fully understand that they had to move toward the adults. That is why afterwards the adults tried to move toward the participants so that they could try blowing the whistles (18:26-22:18).

Interview for session 5

They didn't understand that they had to come to us. We whistled to them and they moved where they wanted. They didn't come toward the whistle. Apart from that, though, they worked on moving in the water...

2.3. Disruptive behaviour

2.3.1./2.3.2. Interviews with the tutor for sessions 9 and 15

Yes, because they are in the water, having fun doing the activities, they don't need to attract attention or play up. They enjoy themselves and do the activities we suggest, and they laugh, stretch out and relate to each other. And they don't need to say « I'm getting bored » because they don't get bored at any time, so now they don't put their thumb in their mouths or pull their hair.

If, as well as working on things, you offer them the materials in a motivating way with different activities, there is no disruptive behaviour. They are concentrating on playing and having a good time and testing out different things. They aren't bored and don't need to attract our attention. They have everything within reach and they're having fun.

Discussion and conclusions

In general lines, from the results observed it can be stated that the programme had interesting contributions in the participants, which can be positive in their integral education as a whole and in their quality of life. It is worth noting that at no time did we try to observe the benefits in an isolated way, but rather as a contribution to the other activities carried out in the school timetable.

The experience had positive repercussions on the emotional dimension selected from the definition of quality of life mentioned by R.L. Schallack [26] and compiled in the results. This idea is emphasized by authors such as I. Galcerán [7]; J.P. Kamenef [16]; J. Newman [20]; D. Salaün et al. [25]; J. Vázquez [28, 29], pointing out that the aquatic medium offers psychological and social benefits as well as physical benefits.

In accordance with the idea expounded by S.A. Peganoff [21] in his study – on the importance of working objectives related to pleasure as they influence the improvement of self-esteem – our programme was aimed at getting the pupils to enjoy themselves in the different activities, in order to foment their willingness and interest towards working the different contents.

One of the aspects that is considered worth noting is the great possibility of transference the aquatic medium had onto land, above all in terms of movement (attitude of greater assurance, improvement in balance and in stability), an idea pointed out in the studies by S.R. Harris [11] and Y. Hutzler et al. [13]; and also, in the specific case in question, it was possible to observe in the work the recognition of different images and photographs related to the identification and recognition of feelings and emotions (happy and angry).

The aquatic medium contributed to the participating pupil being able to have feelings of freedom, being able to move without the need to use a walking frame, wheelchair or the physical support of an adult, an aspect which directly

affected the affective-emotional environment; the possibility of moving by themselves, could be seen reflected on their faces, in their smile, their looks and their expressions throughout the activities. Authors such as E. Botella [2], M.J. Reid [22], M.A. Monge [18] and A.J. Schilling [27] emphasized this fact in their works.

As far as disruptive behaviour was concerned, even though in our case it did not happen, it is worth noting that we took into account the idea proposed by J. Vázquez [28], which consists of using the motivating element of water to intervene in this behaviour, offering alternatives adapted to each participant.

To differentiate the sub-categories, we used what had been demonstrated by the participants and what we could distinguish from the aforementioned sources of information. It was fundamental to have contact with the participants prior to the programme's application in order to understand how they show what they feel and how they show displeasure or joy and well-being. In short, it is important to understand the pupil's means of communication.

In conclusion, it is worth highlighting an idea that is also stated by M. Getz et al. [8]; this is the fact that the programme was aimed at a specific context, with pupils with certain characteristics, which is why we do not try to generalise the results; however, we consider this research can be useful and serve as a starting point for work in other centres, to extract examples and work as a possible educational resource.

BIBLIOGRAPHY

1. Berry R.J., Leitner R.P., Clarke A.R., Einfeld S.L. (2005). Behavioral aspects of Angelman syndrome: a case control study. *American Journal of Medical Genetics*, 132 (1), 8–12.
2. Botella E. (1992). L'esport i la paràlisi cerebral. Catalunya: Departament de Benestar Social.
3. Bovi F., Palomino A., González J.J. (2008). Avaluació i contrast dels mètodes d'ensenyament tradicional i lúdic. *Apunts. Educació Física i Esports*, 94, 29–36.
4. Brun C. (2002). Características psicológicas en el síndrome de Angelman. A Libro de Ponencias de las I Jornadas Nacionales de Síndrome de Angelman (pp. 53–57). Barcelona: Asociación Síndrome de Angelman.
5. Cantalops J. (2008). Elaboració i aplicació d'un programa aquàtic al CEE "Pinyol Vermell" (ASPACE) de Mallorca. Tesis doctoral no publicada, Universitat de les Illes Balears, Palma de Mallorca, España.
6. Castillo M., Palacios J. (1988). Natación especial para minusválidos físicos motóricos. *Comunicaciones Técnicas*, 5–27.
7. Galcerán I. (1995). Espina bífida y natación. *Comunicaciones Técnicas*, 6, 55–64.
8. Getz M., Hutzler Y., Vermeer A. (2006). Effects of aquatic intervention in children with neuromotor impairments: a systematic review of the literature. *Clinical Rehabilitation*, 11 (20), 927–936.
9. Godoy C.A. (2002). Programa de actividades acuáticas para la salud. *Lecturas: Educación Física y Deportes*

- (Revista Digital), Año 8, 45. Document consultat a: <http://www.efdeportes.com>
10. González V. (2001). El equipo multiprofesional en los programas de natación y salud. *Comunicaciones Técnicas*, 6, 63–67.
 11. Harris S.R. (1978). Neurodevelopmental treatment approach for teaching swimming to cerebral palsied children. *Physical Therapy*, 58 (8), 979–983.
 12. Herran J.A. (1988). La adaptación y familiarización en función de los minusválidos. *Comunicaciones Técnicas*, 1–16.
 13. Hutzler Y.; Chacham A.; Bergman U.; Reches I. (1998). Effects of a movement and swimming program on water orientation skills and self-concept of kindergarten children with cerebral palsy. *Perceptual and Motor Skills*, 86 (1), 111–118.
 14. Ji-Houn A., Hyum-Min L., Soo-Jin O., Yang-Ja H. (1999). The effects of swimming on knee flexor and extensor strength in children with cerebral palsy. A H. Nakata (Ed.), *Adapted physical activity. Self-Actualization Through Physical Activity* (pp. 91–99). Fujisawa, Japan: Shonan Shuppansha Co.
 15. Jones J.A. (1988). To float or not to float. A J.A. Jones (Ed.), *Training guide to cerebral palsy sports: the recognized training guide of the United States Cerebral Palsy Athletic Association* (pp. 167.172). Champaign: Human Kinetics.
 16. Kameneff J.P. (1975). Reeducation psycho-motrice dans l'eau. Ou observations actives sur le comportement dans l'eau de jeunes enfants handicaps. *Revue de neuropsychiatrie infantile*, 23 (5-6), 345–354.
 17. López I. (2003). Educación para la paz y la solidaridad en el medio acuático: actividades para la reflexión. *Comunicaciones Técnicas*, 3, 47–53.
 18. Monge M.A. (1993). Manual de actividades acuáticas para niños con parálisis cerebral infantil. A XIV Congreso Panamericano de Educación Física I, (pp. 83–90). San José, Costa Rica: Universidad de Costa Rica.
 19. Moore T. (1966). Spastics in water. *Develop. Med. Child. Neurol*, 8 (4), 428–431.
 20. Newman J. (1976). *Swimming for children with physical and sensory impairments: methods and techniques for therapy and recreation*. Springfield, Illinois: Charles C Thomas Publisher.
 21. Peganoff S.A. (1984). The use of aquatics with cerebral palsied adolescents. *American Journal of Occupational Therapy*, 38 (7), 469–473.
 22. Reid M.J. (1975). Activity in water based on the Halliwick method. *Child: care, health and development*, 1 (4), 217–223.
 23. Rider R.A., Modell S. (1996). Aquatics for children with angelman síndrome: earning your water wings. *Pa-laestra*, 12 (4), 28–33.
 24. Rosell J. (1991). Natación utilitaria y actividades acuáticas complementarias para adultos. *SEAE / INFO*, 15-16, 11–18.
 25. Salaün D., Grouazel Y., Bourges M. (1987). Familiarisation en piscine avec un groupe d'enfants (handicapés moteurs). *Motricité cérébrale*, 8, 99–108.
 26. Schalock R.L. (1999). Hacia una nueva concepción de la discapacidad. A M. Á. Verdugo i F. B. Jordán de Urries (Eds), *Hacia una nueva concepción de la discapacidad* (pp. 79–109). Salamanca: Amarú.
 27. Schilling A.J. (1994). *Aquatics and persons with disabilities*. Second Printing. *PAM Repeater*, 80, 2–15.
 28. Vázquez J. (1996). Programa de intervención para disminuidos psíquicos en el medio acuático. Canarias: Viceconsejería de Cultura y Deportes. Dirección General de Deportes del Gobierno de Canarias (document audiovisual).
 29. Vázquez J. (1999). *Natación y discapacitados. Intervención en el medio acuático*. Madrid: Gymnos.
 30. Villagra H.A. (1999). Incidencia del programa acuático adaptado en niños con parálisis cerebral. *Lecturas: Educación Física y Deportes (Revista Digital)*, Año 4, 16. Document consultat a: <http://www.efdeportes.com>

Received: January 2010

Accepted: February 2010

Published: March 2010

Correspondence

Dr. Jaume Cantallops Ramón
Carretera de Valldemossa, Km. 7,5
Edificio Guillem Cifre de Colonya, 07122, Palma de Mallorca (Balearic Islands, Spain)
e-mail: jaume.cantallops@uib.es

Relaxation and Breathing Techniques – Positive Factors in the Deployment of Pregnant Woman’s Labor and Delivery

Doriana Ioana Ciobanu

Universitatea din Oradea

(University of Oradea, Faculty of Physical Education and Sport,

Department of Theoretical, Medical Disciplines and Physical Therapy, Romania)

Abstract

Objectives: Anxiety and stress are very common during pregnancy, but not a good side effect of it. Pain is a big issue that pregnant women have to cope with when the big moment comes – the delivery.

The aim of this study is to determine the role of direct or passive relaxation and breathing exercises on labor deployment. We also want to determine the relationship between these exercises, pain level and drugs administration.

Methods: The study group consists of 70 pregnant women, in the third trimester, 35 from them having a relaxation and breathing exercises program. In order to assess the presence and the severity of anxiety and also its evolution during pregnancy, the State – Trait Anxiety Inventory (STAI) was completed.

Results: In their majority, the outcomes are statistically representative ($0 < 0,01$) and that means that the anxiety episodes are really reduced in case of pregnant women who practiced both relaxation and breathing exercises.

Key words: anxiety, pain management, physical therapy intervention, labor, painkillers administration

Introduction

Women and babies have been interrelated since the very beginning.

For many of them, pregnancy and delivery are often times of worry: how will the mom herself change, how painful will the labor be, can she handle it [16]? Anxiety attacks in case of pregnant women can have physical as well as psychological aspect.

The above mentioned happens because during pregnancy, women's hormones go haywire, blood sugar levels fluctuate rapidly and there is a lot of action going on inside the mother's body [9]. Women can feel anxious over the actual birth process.

They may be afraid that they will not know what to do once the baby is here. Pregnancy is a life-changing event. It is natural for woman to feel anxious. Sometimes these feelings turn into a full-blown anxiety or panic attack. Anxiety and panic attacks are more common in the last months of pregnancy (Getting Along with Anxiety Treatment in Pregnancy, 2009).

This anxiety state causes that it is impossible for a future mother to relax its body during the labor. That makes it more and more painful, causing a vicious circle: fear – impossibility to relax – pain – fear... etc.

In the past women had no choice: it was inevitable and also necessary to suffer in order to give life, infliction being the redemption of the sin and the price of motherhood status.

In the oldest sacred indian writings from 3000 years ago, methods for relieving pain and giving back the woman's strenght, using breathing techniques and yoga techniques were presented.

These exercises are succesfully used even nowadays.

„Even joyful deliveries have to be painful”. This conviction has different moral explanation, being some kind of cult of pain, a vision about the delivery, which is, at the same time „a masterpiece and a prove of sin”, says Mireille Larget, in her book „Naissances: L'accouche-ment avant l'age de la clinique” [7].

In the usual language, pain and labor are synonyms: „she will have pains” means that the labor begins”. There is „mild pains”, „powerfull pains” and „bashing pains”.

Women from the past, in their majority, suffered in the labor, but not all of them, because there were mothers who did not suffer; nowadays it is the same. Claude Revault d'Alones, in 1960, estimated that there were 8%–10%

of cases when, without any training, the labor was carried out without misery.

Variability of pain at birth is one of the main characteristics of it.

Physiological birth is strongly connected with pain experience.

The sensitive peripheral stimulation are [17]:

- Extension and microlaceration of the cervix,
- Extension of the inferior segment of the uterus,
- Extension of the ligaments and tubar-ovary organs,
- The compression of lumbosacral plexus,
- The compression of pelvic joints,
- Uterus ischemia due to metabolic acidosis, uterus reactivity or uterine spasm.

The labor is determined by the personality and experience of a woman that will give birth. The labor is also very inscrutable. Pain is the aspect of birth where the regularity has a better representation. The rhythm is given by increasing and decreasing, accelerations and decelerations. And also it is individual. Pain in the labor is intermittent. One of the biggest secrets of the labor consist of that intermittent characteristics [15].

The benefits of physical exercise in labor deployment

Data from researches show that there is no study that demonstrates higher risk for the early labor or early membrans breaking for women who are practicing physical exercise and who did not have previous risk in these conditions.

The most studies show that exercising has no negative impact on labor duration [1]. Some studies show that women who practice any kind of physical activity need a decreased number of medical intervention in the labor and delivery, such as: oxtocin administration, forceps or C-section [8].

Other benefits are:

- continuous physical activity in pregnancy has positive benefits on labor deployment,
- the body is well prepared for birth process,
- decreasing the duration of delivery [3],
- reducing anxiety,

- increasing selfcontrol during painfull episodes due to uterus contractions in labor,
- increasing the capacity of pain management in labor,
- decreasing the delivery period,
- an easy expulsion of the fetus,
- avoiding some complications that can arise during the labor (hip sprain, symphysiolysis, diastasis recti).

Hypotheses

Pregnant women who are practicing relaxation and breathing exercises during their pregnancy will have an increased capacity of coping with labor pain, and in that way reducing drugs administration and having a shorter labor and delivery period.

There is significant difference between the level of pragnant women's anxiety as a state and trait from the initial assesment and the level of anxiety from the begining of the labor, inside the experimental group and the control group.

Subjects

Participants were 70 pregnant women in the third trimester, having their first baby, attending 5 private obstetric consulting rooms in Oradea. Pregnant women were at the age between: 21–25 years old (20%); 26–30 years old (50%); 31–35 years old (22%); 36–40 years old (8%). Most of women came from urban environment (74%) and the rest from rural environment (26%). 56% of women had higher education, the rest of 44% had college education.

The subjects were separated into two groups:

- experimental group – consists of pregnant women who followed an exercise program in order to be fit for delivery,
- control group – consists of pregnant women who chose not to follow an exercise program.

Pregnant women from the experimental group (50%) followed relaxation and breathing exercises program in the period of 12 weeks.

Material and methods

From a physical point of view, a pregnant woman learns how to lead the breathing, muscles and relaxation. The main advantage

of these exercises is to allow a pregnant woman to be fit during pregnancy, to learn the correct breathing and convenient relaxation. A pregnant woman who exercises learns basic elements of relaxation, breathing, is capable to reduce her tension to a minimum level, strengthen the muscles and when the time for birth comes, she can participate actively in the birth process. Even so, a woman who has done no exercise, but knows how to deploy the labor, will bring the child to life in an easier manner than a pregnant woman with an athletic body, but who ignores everything about a birth.

The exercise program consists of: exercise for learning the correct breathing; types of breathing specific to labor stage; types of breathing specific to delivery stage; exercises for mental and physical relaxation.

Breathing technique implies breathing with a certain number of repetitions and amplitudes.

Some women prefer deep breathing, using the diaphragm in order to fill their abdomen with air.

Some of them prefer easy breathing, inhaling air as much as they can fill their chest.

The purpose is to help a woman to find out that breathing technique can help her to relax and to cool her down. Breathing must have a comfortable rhythm, do not shorten the breathing and do not induce dizziness. The more knowledge about the labor and delivery a woman has, the easier it will be for her to notice all types of breathing techniques used in the different phases of the labor.

A woman must learn how to use her breathing in order to concentrate in the way, that each contraction becomes a productive part of the labor. Breathing techniques are useful when a woman tries out different types of pain, discomfort, anxiety or fear. She will be able to use them any other day or stressful situation [11].

A pregnant woman's training consists of the following means for fighting off the peripheral pain factors:

- deep breathing with prolonged exhale; vocalize (with open throat),
- pelvis mobilizations,

- capacity to make the difference between tension and relaxation state,
- capacity of quick relaxation of tensioned segments: a relaxed muscular tone will sedate the painful signals sent to the brain, in this way closing the control door of pain, localized in the posterior horn of the medulla.

Painful stimulation is perceived by the brain at an inferior level:

- the movement during the labor;
- massage, heating pillow, showers and hot bath during the labor
- respecting the labor's physiological laws

A pregnant woman's training consists also of the following means for fighting off the central pain factors:

- cultural deconditioning: changing the perception about the value of pain, creating the motivation and the possibility to choose;
- personal deconditioning: expressing personal experiences, positive conditioning in order to reduce fear and pain and creating some individual expectations;
- working on the rhythm and on the active and passive attitudes in the relationship with pain or other events;
- knowledge of the existence of the pauses between contractions;
- favoring the instinct and intuition;
- positive affective communication with the partner and/ or other supportive persons;
- support of a midwife, known before the labor;
- maintaining the intimacy and the protection of the labor's place in order to stimulate the instinctive behavior and to cut out any aggressive or disturbing factors;
- stimulating the endorphins synthesis.

Traffic crowd, headache and daily chores are good opportunities for pregnant women to exercise the different breathing technique and in that way it becomes a daily routine. In order to stimulate the labor, some prenatal physical educators suggest pregnant women to hold an ice cube in her mouth, for an effective execution of breathing techniques, during the momentary pain that appears [2].

Deep abdominal breathing can be practiced anytime: when reading, driving, at a workplace, watching TV or in any other stressful moment

etc. This kind of breathing is beneficial not always during the labor, but anytime in life.

It is important to exercise the other breathing as well, so that a pregnant woman is used to them and is able to use them for about 2 minutes and not to leave out blast. If dizziness occurs, a deep purifying breath can change other breathings. If necessary, a pregnant woman can breath with both hands close to her mouth and nose or into a paper bag. This breathing will be exercised from different positions: sitting, lying on a side, standing, on knees and hands.

In order not to forget about breathing techniques, a pregnant woman can make some links as: at the red light she can do "hi-hi" type of breathing. During TV commercials, she will do "hi-hi-huuu" breathing [4].

There are many payoffs of practicing breathing techniques: breathing becomes an automatic response to pain. A more relaxed mother will respond in a positive manner to pain. The breathing rhythm will remain normal/calm. Breathing techniques determine a well-being status and became a measure of control, it will secure more oxygen in order to have strength and energy for a mother and a child; it brings a purpose for each contraction, making them more productive.

From the physical point of view, relaxation does not represent decreasing of muscular tone, but a correction of it. Therefore, an essential element from training lessons is represented by having the capacity to voluntary relax all body parts.

During the relaxation program, a woman must concentrate on different parts of her body. She must induce a calm status by attention orientation.

"By presenting faces with expressions, this scale follows the same guideline as the numerical scale. Zero is represented by a smiley face, while 10 is represented as a distraught, crying face.

This scale is also useful when rating pain with children or for adults with mild cognitive impairments" [6]. Subjects were asked to point out the face that fits the most with the level of their pain.

Breathing and relaxation techniques become usual campaigners for stressful factors of daily living [13].

Measurements

In order to investigate outcomes of exercise relaxation and breathing techniques on labor deployment, the following have been monitored: duration of the labor, duration of delivery, pain intensity level, drugs administration. The labor and delivery duration were established in hours, respectively minutes.

For the assessment of labor duration, delivery and drugs administration, we used a questionnaire that consisted of questions regarding these parameters. This questionnaire was applied to women the first day after a natural birth. They were asked to complete a questionnaire that consisted of 4 items, referring to: duration of the labor (hours, minutes), duration of the delivery (minutes), pain killers administration (yes/ no) and antispastic medication (yes/ no).

For the assessment of pain level, the Pain Rating Scale was used (Figure 1).

A pain scale is a mean used by physicians and other health care providers to measure patient's pain, so that they can help to plan how to control it best. On most pain scales there are numbers from 0 to 10: 0 means no pain and 10 means the worst pain the person has ever known or felt.

The patient is asked to use the list below to find the number that best describes his/her pain.

- 0 = No pain
- 1 to 5 = Mild pain
- 6 to 7 = Moderate pain
- 8 to 9 = Severe pain
- 10 = Worst pain possible [10].

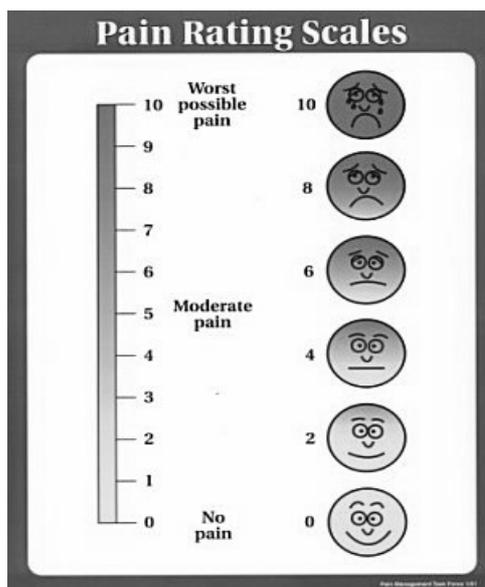


Figure 1. Pain Rating Scale¹

In order to assess the level of anxiety, The Anxiety State and Trait Inventory (STAI) was used [12]. This inventory is a self-report instrument that differentiates between the temporary condition of state anxiety and the longstanding quality of trait anxiety, so that appropriate treatment can be developed. The STAI consists of two scales, both containing 20 items, with a range of four possible responses to each. One scale addresses to a temporary condition – state anxiety (S-Anxiety) while the other scale addresses to a more general and long-standing condition – trait anxiety (T-Anxiety). The total score indicates which type of anxiety is prevalent [14].

The results of this questionnaire can be synthesized on the following levels of anxiety (a state, trait), as follows: low level (score between 20–34), mild level (score between 35–49) and high level (score between 50-60).

The consent of pregnant women was obtained before data collection.

Results and Discussion

SPSS soft was used in order to do the statistical data analysis. Table 1 includes the initial characteristics (mean, std. dev.) of the entire studied group and separate, and both for the group of women who practiced relaxation and

breathing techniques and the group of those who did not. Also, the table presents the characteristics for the duration of the labor and delivery and the level of pain.

Data distribution for both the experimental group and for the control group has no normal distribution, and that makes us use nonparametric tests.

In order to make a comparison between the two study groups, we used the Mann-Whitney U test for independent test specimens.

In order to establish any association between the level of pain and the drugs administration, the Chi² test of association (independency) was used.

Mann-Whitney U Test for independent test specimens shows that the evolution of observed parameters was different on the experimental group towards the control group, for: duration of the labor and pain intensity level. The experimental group presented low levels of pain intensity towards the control group.

There was no different evolution of delivery duration between two groups.

In case of pregnant women from the experimental group, a pain level significantly decreased towards the control group. This can be explained by the fact that pregnant women from the experimental group learned to control their pain by knowing and practicing the relaxation and breathing techniques used during the labor. Also, when having a knowledge about the labor, they will not feel that „fear of unknown” and in that way the vicious circle is broken: fear – incapacity of relaxing – strong contractions – pain – fear... etc.

Pregnant women from the experimental group scored their pain level as 8 on average in comparison with those from the control group, who scored their pain level as 9 on average ($p = 0,000$).

Pregnant women from the experimental group had labor duration (5h și 57 min.) significantly decreased ($p = 0,000$) in comparison with pregnant women from the control group, who had 8h și 55 minute of labor duration.

¹http://images.google.ro/imgres?imgurl=http://kerriesmyres.ty.pepad.com/photos/uncategorized/pain_scale_1.jpg&imgrefurl=http://

Table 1. Comparison between experimental and control groups for the initial characteristics (mean±std. dev.)

Initial assesment	Entire group (70)	Exp. group (n = 35)	Ctrl. group (n = 35)	p
labor duration (hours)	7,16±2,71	5,57±2,72	8,55±2,49	ns
delivery duration (hours)	0,30±0,42	0,21±0,35	0,39±0,53	ns
pain intensity level in labor (score)	8,64±0,94	8,14±1,95	9,14±0,823	ns

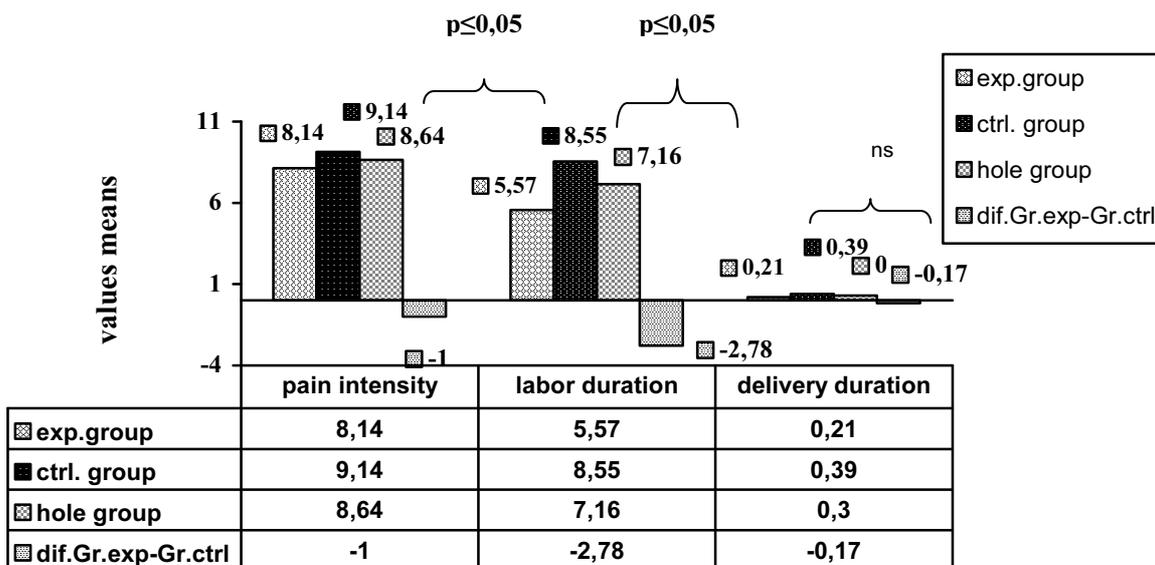


Figure 2. Comparison of the labor parameters between experimental and control group (pain intensity, labor and delivery duration)

Pregnant women from the experimental group had delivery duration (21 minutes) significantly decreased ($p = 0,000$) in comparison with pregnant women from the control group, who had 39 minutes of delivery duration.

Reducing the pain level, labor and delivery duration are very important objectives in labor deployment, because this stage is very demanding both for a mother and a child.

As the statistical analysis provided, we can acknowledge that breathing and relaxation techniques are very important in correct and efficient orientation of the labor and delivery deployment, so that it can be beneficial for both a mother and a child.

Chi² test of association (independency) indicates a strong association between the level of pain during the labor and pain killers administration

(Figure 3). The same association is also presented in case of antispastic medication (Figure 4).

Pregnant women who had decreased level of pain received significantly less pain killers administration ($p = 0,000$) in comparison with pregnant women with high pain level and a lot of more painkillers administration.

We may say the same about the antispastic medication administration which was lower for the experimental group, in comparison with the control group.

These variables (state anxiety and trait anxiety) have normal distribution ($p > 0,05$). In this case, the inferential statistics will be used for data analysis.

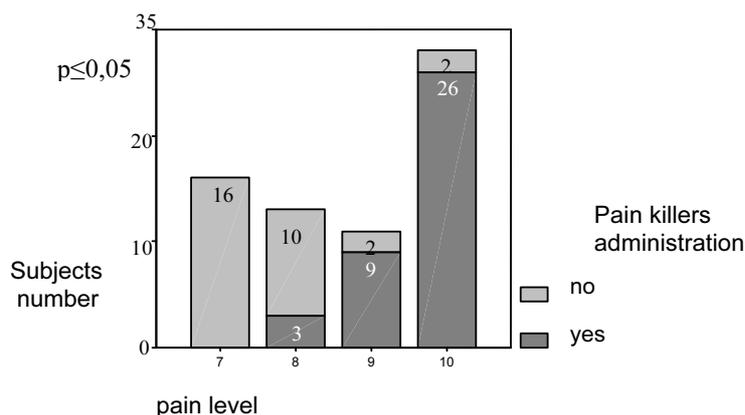


Figure 3. Association between pain level and drug administration

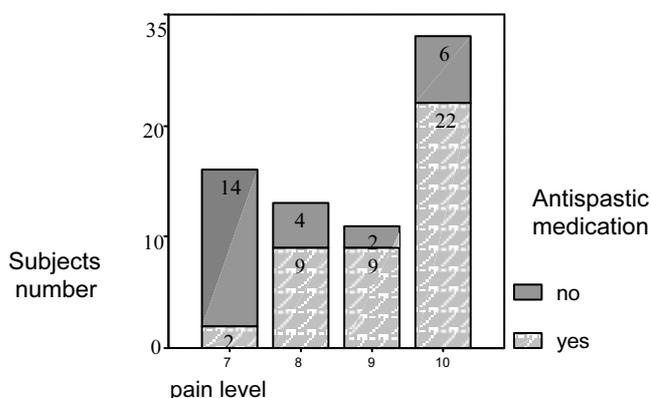


Figure 4. Association between pain level and drug administration

Table 2. Comparison between experimental and control group regarding the characteristics of ordinal variables (mean± st. deviation, Kolmogorov-Smirnov)

	Experimental group (n = 35)			Control group (n = 35)		
	Mean±Std. Dev.	K-S*	p	Mean±Std. Dev.	K-S*	p
State anxiety (scor)	44,83±7,24	0,234	0,015	46,77±6,16	0,155	0,032
Trait anxiety (scor)	44,80±9,89	0,211	0,000	50,06±7,53	0,191	0,002

The comparison of initial data reveals that there are no significant differences between the characteristics of the experimental group and the control group, for anxiety as a state and trait ($p > 0,05$). This will allow us to compare the characteristics of final data for both groups.

Regarding the initial level of anxiety as a state and trait, with scores of 44,83 for the experimental group, respectively 46,77 for the control group (Table 2), both groups have a mild

level of anxiety, for anxiety as a state and trait (mild level – score between 35–49).

After following the exercise program, this parameter was improved especially for the experimental group, as follows.

Intragroup analysis (sign test: $0,021 \leq 0,05$ for anxiety as a state and $0,002 \leq 0,05$ for anxiety as a trait) confirm the hypothesis that there is a significant difference between the anxiety level as a state and as a trait, from the beginning and

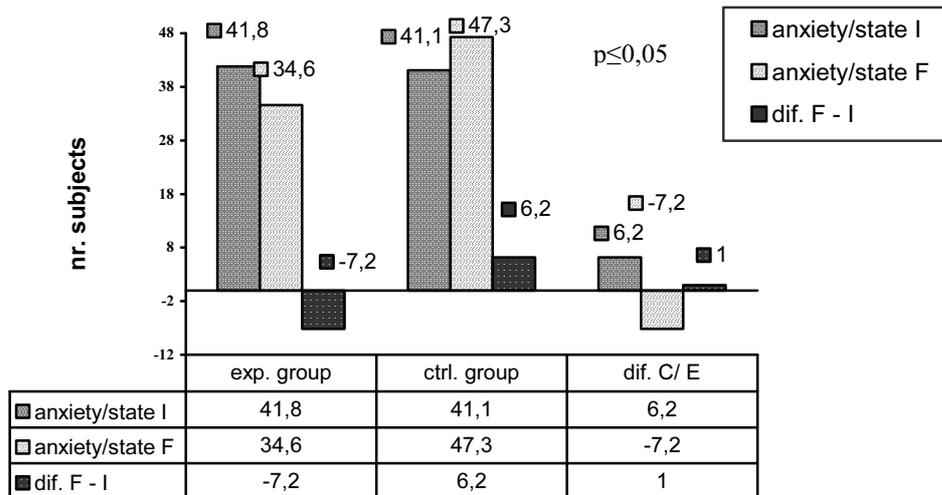


Figure 5. Comparison of the level of anxiety as a state (mean): initial/ final/ difference(exp. group/ ctrl. group)

the end of pregnancy for both groups. However, the anxiety scores of the experimental group enroll in a low/ medium level of anxiety (as state: 34,6 and trait: 35,2). The anxiety scores of control group reach the upper limit to a high level of anxiety (as a state: 47,3 and a trait: 47). This result highlights the importance of exercising in pregnancy.

The Wilcoxon Test for paired test specimens: initial/ final – $0,007 \leq 52$ (critical value $p = 0,05$) for anxiety as a state and $0,052 \leq 52$ confirms that there is a significant difference between the anxiety level from the beginning and the end of pregnancy, for both test specimens.

The Mann-Whitney U Test for independent test specimens (the experimental group/ control group) allows for intragroup analysis. It has been observed that pregnant women from the experimental group have a mean level of anxiety at the end of pregnancy (mean score 34,6 for a state and 35,2 for a trait). Pregnant women from the control group present a tendency of increasing the anxiety level (mean score 47,3 for a state and 47 for a trait).

There is a significant difference between anxiety level, both for a state and trait, of the experimental group and one of the control group, at the end of pregnancy (Mann-Whitney U score $15 \leq 23$, critical value Mann-Whitney U for $p = 0,05$, for anxiety as a state and $17 \leq 23$ for anxiety as a trait).

The anxiety level is low for the experimental group (difference of - 7,2p and - 4,3p for anxiety as a state). Although these values are low, they are very important because they point out the reduce of anxiety level from medium to low. This will have a great impact on pregnant women behavior during the labor, because of reducing a fear state that is responsible for the incapacity of pregnant woman to relax and on the other hand, on labor duration. The anxiety level is significantly increased in the control group (a difference of 6,2p and 2,2p for anxiety as a trait) with a negative impact on labor development.

The above mentioned allows us to underline that by having an active life and a program of exercising, a pregnant woman will be able to maintain her anxiety level on a normal level, she will learn to relax and control her pain more efficient, all in all she will be ready for the delivery.

Conclusions

Maternity is a special condition for women, due to the fetus development in the uterus and changes of maternal body, pursuant to the presence of conception product and to the necessity of assuring appropriate conditions, which will secure a normal development and delivery.

It is necessary to screen the most efficient means and methods of physical assistance, in order to help the maternal body for an easier pregnancy, labor, delivery.

After following the exercise program, the results indicate an upgrade testing parameters on the experimental group. This will have a positive impact on labor delivery for the experimental group in comparison with the control group, presented as decreasing drugs administration.

Regarding labor parameters assessed, they were upgraded for the experimental group, translated through reduction of the labor and delivery duration, reduction of drugs administration, and reduction of pain level.

Regarding labor parameters, they showed an improvement in labor deployment for pregnant women from the experimental group, translated through decreasing labor and delivery period, decreasing drugs administration (pain killers and antispastic medication) and a decreased level of pain. Research data showed significant association between the level of pain and painkillers and antispastic medication administration, and also between the length of the labor and delivery, and the state of fetus at birth. The anxiety level as a state and treat, even though it was medium

at the beginning of the labor, in case of two groups it has been reduced in the end of pregnancy, unlike the control group, where anxiety level increased hereinafter.

This finding allows us to affirm that thanks to active life style, expressed in participating in a physical training and preparing for birth, a pregnant woman will be able to maintain her anxiety in normal limits, she will learn to relax herself and to control her pain with more efficiency, which will allow her for an active participation in the delivery process.

Acknowledgements

Authors are endlessly grateful to all physicians (obstetricians) who wanted to involve in this study. We are also grateful to all physical therapists for their work. And at last, but not least, special thanks to all pregnant women who understood the importance of this study for them and for all future mothers.

BIBLIOGRAPHY

1. Bell R.J., Palma S.M., Mumley J.M. (1995). The effect of vigorous exercise during pregnancy on birthweight, *Aust NZJ Obstet Gynaecol*; 35 (1): 46–51.
2. Bosomworth A., Bettany-Saltikov J. (2006). Just take a deep breath... A review to compare the effects of spontaneous versus directed Valsalva pushing in the second stage of labour on maternal and fetal wellbeing. *MIDIRS Midwifery Digest* 16(2): 157–165.
3. Clapp J. F. II (2002). *Exercising through your pregnancy*, Addicus Books, Omaha, Nebraska.
4. Downe S., Trent Midwifery Group, Young C. et al. (2004). The early pushing urge: practice and discourse. In: Downe S. ed. *Normal childbirth: Evidence and debate* London: Churchill Livingstone: 121–140.
5. *Gynecol* (1990). Dec;163(6 Pt 1):1799-805, PMID: 2256485 [PubMed - indexed for MEDLINE].
6. Jacques E. (2010). *Using Pain Scales to Effectively Communicate Pain Intensity*, By, About. com Guide, updated January 06, 20 10.
7. Laget M. (1982). *Naissances: l'accouchement avant l'âge de la*, Lieu d'édition : Paris, Éditeur: Éditions du Seuil.
8. Marcoux J. (1989). *Epidemiol. Comm. Health*; 43: 147–152. Clapp J.F.III. (1990) - The course of labor after endurance exercise during pregnancy, *Am J Obstet* .
9. Miu Andreea, kinetoterapeut Centrul Medical Duo (2008). *Importanța exercițiului fizic în perioada sarcinii*, publicat în *Săptămâna Medicală*, 09. iulie, Etichete : Jurnal de sarcină Getting Along with Anxiety Treatment in Pregnancy, <http://www.squidoo.com/ANXIETY/TREATMENT-IN-PREGNANCY>, reviewed on 10.08.2009
10. Nissl J., R.N., B.S. (2009). *Pain Rating Scale*, <http://www.health.com/health/library/mdp/0,,stp1310,00.html>
11. *Paternal Breathing during Labour*, <http://www.americanpregnancy.org/labourbirth/aptpaternalbreathing.ht>, (2007).
12. Robu V. (2009). *Test Anxiety Inventory (STAI) Standardization on a Group of Romanian High School Students*, *Journal of School Psychology*, issue 03, pp. 58–47
13. Simkin P. (2001). *The Birth Partner: Everything you need to know to help a woman through childbirth*, Second Ed., Ch. 4., Boston, The Harvard Common Press.
14. Spielberger C. D., Gorsuch R.L., Lushene R.E. (1970). *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press.
15. Taylor S. (2002). *The Tending Instinct: Women, Men and the Biology of our Relationships*, New York: Times Books Henry Holt Company.

16. Teixeira J., Martin D., Prendiville O., Glover V. (2005). The effects of acute relaxation on indices of anxiety during pregnancy, *Journal of Psychosomatic Obstetrics and Gynecology*, 2005, vol. 26, n^o4, 271–276.
17. Tuteur A. (2006). The function of pain in childbirth, <http://homebirthdebate.blogspot.com/2006/07/function-of-pain-in-childbirth.html>

Received: January 2010

Accepted: February 2010

Published: March 2010

Correspondence

Doriana Ioana Ciobanu
Str. Universității, nr1, loc. Oradea, jud. Bihor, cod postal 410087
Tel: 0040722187589
e-mail: doriana.ciobanu@yahoo.com

INFORMATION FOR THE PAPER AUTHORS

European Journal of Physical & Health Education. Social and Humanistic Perspective is a science periodical published by the three universities: Academy of Physical Education and Sport in Gdansk (Poland), University of Oradea (Romania), University of Balearic Islands (Spain) which discusses following problems:

- health of children, adolescents and adults,
- physical activity of children, adolescents and adults,
- attitudes towards health presented by children, adolescents and adults,
- knowledge about health presented by children, adolescents and adults,
 - initiatives, programs to improve health,
- physical and health education in school curricula and public services,
 - training teachers of different specialties,
- developing professional skills by teachers and
 - training and employing teachers.

European Journal of Physical & Health Education. Social and Humanistic Perspective publishes papers only in English:

- original papers (anonymously reviewed),
- demonstrative papers,
- editorial papers,
- polemics,
- conference and symposium information.

The quantity of the original papers (including tables, figures, bibliography, abstract) is 20.000-30.000 marks including spaces.

Layout of the materials submitted to publish:

1. *page*: title, names and surnames of authors, name and address of the institution represented by authors, post address, telephone number, e-mail, agreement, 2. *page* and following pages: titles, abstract (20 to 25 lines), keywords (to 7), text.

Materials submitted for publication (text, tables, and figures with numeric data describing them) should be sent in only as a Word document with doc. extension as an e-mail attachment.

Text should be sent by the first author from his or her e-mail box.

Layout of the original paper: abstract, introduction, aim, materials and methods, results, discussion, conclusion, bibliography (up to 30 positions).

Footnotes in the paper referring to bibliography should be marked with the Arabic numbers and square brackets. Bibliography listing should be numbered in *alphabetical order*.

Submitted paper cannot be printed or submitted to publish in another journal.

Statement confirming this condition should be in the front page of the paper.

Submitting a paper to publish and attaching other data is considered a conscious agreement to print and publish it electronically, also in the Internet.

The editorial office reserves the right to shorten papers, correcting linguistic mistakes and making any other editorial corrections.

Authors do not receive any royalty for publishing their articles. Authors receive a copy of the journal.

Editorial office address

(Editor-In-Chief: prof. Tomasz Lisicki)

European Journal of Physical & Health Education. Social and Humanistic Perspective

Akademia Wychowania Fizycznego i Sportu

ul. Kazimierza Górskiego 1

80–336 Gdańsk, Poland

e-mail: eu-p-he@awf.gda.pl

www.journals.awf.gda.pl

