

PROBLEMY PRAKTYKI PSYCHOLOGICZNEJ

JOANNA GÓZDŹ

Uniwersytet Śląski w Katowicach, Instytut Pedagogiki

THE ROLE OF PHYSICAL ACTIVITY IN EDUCATION

Abstract: The aim of this article is to present the influence of physical activity on human development. The relationship between the somatic sphere and the psyche has been evidenced, and some alarming results of research on physical activity have been discussed. In the subsequent parts of the article, basic terminological distinctions are presented, along with the recommendations of the World Health Organisation (WHO) for physical activity and people's motives for engaging in sports.

The article discusses the psychopedagogical effects of physical activity, including its developmental, preventive and corrective outcomes. The results of the research unquestionably confirm that physical activity promotes a holistic human development and is an important component of the educational process.

Keywords: physical activity, sport, recreation, physical education

Introduction

Throughout the history of pedagogical thought, the problem of the unity of soul and body has been discussed since antiquity. The Greek ethical ideal – *kalokagathia* (combination of goodness and beauty) pointed to the necessity of both physical and moral education, which was achieved through sport. Both Athenian and Spartan education attached great importance to physical fitness. The dominant attitude was towards competition and the cult of victory (Mazur, 2014). The reconstruction of ancient thought following the Renaissance contributed to the introduction of outdoor physical exercise into schools for the first time, and compulsory physical education began to be implemented in the second half of the 19th century, so that it could again become widespread in the 20th century (Mazur, 2014).

The current of holistic pedagogy has been emerging since the late 1980s (Szyszko-Bohusz, 1989). Its main task has been specified as the comprehensive development of personality, and addressing the problems of the mental sphere being seen as closely related to the somatic sphere, hence the author of the concept introduces the practical application of relaxation training in education (Szyszko-Bohusz, 1979). The basic assumption of relaxation training, which is commonly used in psychological practice, is that there is a feedback between muscular tension, mental tension and the condition of the nervous system (Kratochvil, 1978). In fact, the unity of “soul and body” is not al-

ien either to Eastern philosophy (Buddhism, yoga, the philosophy of Far Eastern martial arts) or, as already mentioned, to the European pedagogical thought.

Some disturbing findings on fitness and physical activity among children and adolescents

Educators and psychologists should be concerned about the emerging discrepancy between somatic and motor development among children and adolescents. Current trends are positive in terms of growth, with a simultaneous decline in both fitness and physical condition. Population-based studies (590,000 pupils aged 7–19 years) indicate that the physical activity performance of Polish pupils improved in the decade between 1979–1989, and deteriorated significantly thereafter (Maszczak, 2017). The worsening physical fitness is already evident in the “golden period” of motor skills’ development, which is preschool age. The results of the study among preschoolers using the Sekita’s physical fitness test (Polakowski et al., 2020), indicate that only 3% of children reach a high level of fitness. In that particular sample, low fitness levels were achieved by 36% of girls and 41% of boys.

Tucker (2008) shows that nearly half of preschool-aged children do not engage in sufficient physical activity. Current recommendations suggest a minimum of 60 min of physical activity per day; only 54% of participants throughout the studies achieved this. Furthermore, as with other age groups, boys participate in considerably more physical activity than girls.

The issue of the decline in physical fitness is not only raised by Polish researchers but also by the results of worldwide studies, which highlight an emerging negative secular trend (Fuhner et al. 2021), especially in terms of endurance.

Worldwide data for adults (15 years or older) from 122 countries and for adolescents (13–15-years-old) from 105 countries show that 31,1% of adults are physically inactive, with proportions ranging from 17,0% in southeast Asia to about 43% in the Americas and the eastern Mediterranean. Inactivity rises with age, is higher in women than in men, and is increased in high-income countries. The proportion of 13–15-year-olds doing fewer than 60 minutes of physical activity of moderate to vigorous intensity per day is 80,3%. Boys are more active than are girls (Hallal et al., 2012).

Poland is characterized by a high level of physical inactivity (56%), which exceeds the average of 28 European countries by 10 percentage points. Only 28% of Poles undertake physical activity once a week, while the European average is 40%. Finland, Sweden and Denmark are best in this respect with an average of 60–70% (Śmigielski, 2021).

Research reveals extensive cross-country differences in adolescents’ physical activity. In The Programme for International Student Assessment (PISA) in 2015 (since 2000 physical activity data were included only in 2015), students from 52 countries reported average attendance (days/week) in PE classes, and the days/week engaged in moderate activity and vigorous activity outside of school. Average activity levels differed substantially both between and within regions, with potentially important differences in distributions identified – such as a bimodal distribution in the U.S. and Canada in PE. Males were more active than females, as were those from households with higher rather than lower household wealth. These disparities were modest for PE class, but higher for moderate and vigorous activity outside school. PE class attendance was positively correlated with PE curriculum time allo-

cation. Activity outcomes were inconsistently associated with country-level wealth and income inequality (Bann et al., 2019).

In the PISA survey, Poland fared better than in Śmigielski's (2021) publication compared to other countries. The average physical activity of students was 2.8 hours a week (3.2 days a week). Only Hungarian students reported more frequent participation in physical education classes (this is probably due to the fact that Poland has one of the highest rates of compulsory physical education – 135 minutes per week). Polish students reported moderate physical activity (outside school) 4 days a week, and vigorous activity (outside school) 3 days a week. In terms of the first, among boys: USA, Canada, Germany, Denmark had higher results, and among girls: Norway and Netherlands. In terms of intense physical activity, Iceland (boys and girls), Norway (girls), USA (boys) performed better (Bann et al., 2019).

Polish parents of 8-year-olds declare that their children are physically active in their free time most often 1 hour a day on weekdays, and about 2 hours a day on weekends. Every sixth eight-year-old is active less than one hour a day on weekdays (Nałęcz et al., 2021), while notably this is the developmental period of highest physical activity. Research findings demonstrate that physical activity decreases steadily with age, from the age of 7 (Farooq et al., 2018).

The decrease in the frequency of physical activity and the negative secular trend may be due to the change in the lifestyle of children and adolescents, but also of adults, with the majority of time spent in front of computer screens, television or smartphones, and commuting to work or school by car. This example is followed top-downwards, so a physically passive parent will raise a physically passive child.

The research shows that more MIMS-units (Monitor-Independent Movement Summary units) were registered on weekdays compared to weekend days (structured day) for adults and children. The level of differences in physical activity between weekdays and weekend days among adults was larger for men, Hispanic Americans, and those with lower education levels (To et al., 2022). Beets et al. (2010) had similar results. Boys and girls from European and Western Pacific regions had significantly more steps per day than young people from the USA and Canada. Significantly lower steps per day estimates for girls were observed for studies that combined measured steps per day for weekdays and weekend days, in comparison to weekdays only. The number of steps drops on weekdays from the age of 9, and on weekends from the age of 12.

Research shows that males are more active than females. Among college students, women [...] reported less muscle-strengthening activity, lower frequency of weight use and informal sport participation, and higher frequency of cardio and group exercise participation. Women also reported lower comfort using campus recreation facilities, particularly weights areas (Wilson et al., 2022).

There are also differences in physical activity in the place of residence. Urban children are the least active overall, particularly around lunchtime while at school. Compared with children from rural areas and from big cities children from small cities reported the highest levels of physical activity (Joens-Matre et al., 2008)

Lessons in physical education at school, which are supposed to teach and introduce physical culture and prepare children for active involvement in their leisure time, could provide a solution to the problem of low physical activity. Unfortunately, however, these lessons are treated as less important by all adults, including head teachers, who mostly think that the only function of schooling is to provide academic knowledge. Physical exercise lessons (PE) are treated as “second-class”, similarly to religion.

School researchers are often told that PE or religion are the best time to conduct their surveys. Yet this is not the only problem; another issue is the mass exemption from these lessons. Survey results show that in the school year 2012/2013, only 74% of pupils attended all PE lessons and 11% attended at most half of them. Pupil participation in PE decreases with age, and a greater decrease is observed among girls. 20–40% of pupils do not complete the full number of lessons set out in the programme (Woynarowska et al., 2015). This situation has deteriorated even further during the pandemic which introduced the idea of remote PE lessons.

Physical distancing and self-isolation directives, implemented by many national governments to reduce the risk of person-to-person transmission of COVID-19, have been associated with decreased PA engagement. During the initial COVID-19 containment (lockdown) period, PA decreased by more than 25% (Faulkner et al., 2022). Other research (Strain et al., 2022) shows that compared to 2016–19 levels, the odds of reporting any activity in 2020 were 30% lower. The largest declines were amongst non-white ethnicities, the youngest and oldest age groups, and the unemployed. The odds of participating in walking for leisure and gardening were 11% (6–16%) and 15% (9–21%) higher, respectively, whereas the odds for team and racket sport and walking for travel participation were 76% (73–79%) and 66% (64–68%) lower, respectively. Research shows, that individuals engaging in moderate or high volume of PA had significantly better mental health and wellbeing than individuals who engaged in low PA, both during and following periods of COVID-19 containment (Faulkner et al., 2022).

Terminological distinctions and their implications

The legal basis for physical activity in Poland is the Act on Physical Culture of 18 January 1996, which defines the concept of physical culture as part of national culture, which aims to ensure the proper psychophysical development and health of all citizens, regardless of age, gender, religion, race, or degree and type of disability. It is “*knowledge, values, customs, actions taken to ensure psychophysical development, upbringing, improvement of talents and physical fitness of a human being, as well as preserving and restoring health*”. According to this law, these goals are realised mainly through physical education, sport, active recreation and physical rehabilitation.

Physical education is understood as a process shaping the harmonious psychophysical development of children and young people. Nurseries, schools, educational institutions and higher education institutions are obliged to implement physical education in the full-time, daytime program of studies (Act on Physical Culture, 1996). The goal of physical education is not only to develop good physical condition and physical fitness, but also to improve well-being, shape pro-health attitudes, prevent civilization diseases and encourage and prepare for participation in sports and physical recreation (active lifestyle), develop perseverance, improve energy levels and immunity, focus, regularity and comprehensive development of the individual (Famula-Jurczak, 2014).

Sport, according to the Act on Physical Culture (1996), is a form of human activity aimed at improving psychophysical strength, individually or collectively, according to contractual rules. The Act distinguishes between competitive and professional sport; the former being an activity undertaken voluntarily, through competition, in

order to achieve maximum sporting results. Professional sport, on the other hand, is a type of competitive endeavour undertaken for profit. Sport determines two dimensions of human behaviour: competitive and perfectionist (Nowocień, 2021) – the first, refers to confrontation with another person or group of people whereas the second, to “competition with oneself”, self-development and self-perfection, not only physical, but also moral (within the framework of observing the accepted rules of competition and the principle of *fair play*).

Active recreation is a form of physical activity undertaken for rest and renewal of psychophysical strength (Law, 1996). Thus, it can be said that the main features of active recreation are undertaking physical activity in free time, voluntariness and pleasure derived from it.

Physical rehabilitation is a process aimed at restoring, improving or maintaining the psychophysical fitness of temporarily or permanently disabled persons by means of special treatments and physical exercises, based on the current medical knowledge (Act on Physical Culture, 1996).

The activities listed in the Act on Physical Culture (1996) are inseparable and intertwined. Physical activity is in fact the linking element between physical education, sport, recreation and rehabilitation.

Types of physical activity and recommendations of the World Health Organization

Physical activity is any body movement produced by skeletal muscles that requires the expenditure of energy (WHO, 2020). We distinguish between aerobic and anaerobic physical activity; the former is related to the distribution of oxygen in the body. During aerobic exercise, of moderate intensity, a person is able to carry on a casual conversation (Cochran, 2011). Aerobic activity involves prolonged, rhythmic movement of large muscle groups, and it is also known as endurance-related activity, which improves cardiorespiratory fitness (WHO, 2020). Examples of aerobic activity may include brisk walking, Nordic walking, jogging, running, cross-country skiing, rollerblading, rowing and swimming (Kubica, 2021).

Anaerobic activity is based on a short, intense series of exercises, such as body-weight exercises (e.g. push-ups, abdominals, squats), weight-lifting, or sprints (intervals), during which oxygen demand exceeds oxygen supply (WHO, 2020). The aim of anaerobic exercise is to improve the mechanisms of oxygen uptake by the circulatory system, and to reduce recovery time between the times of high effort (Cochran, 2011).

Physical activity is described by four characteristics: type, frequency, duration, intensity. The most commonly used indicator of the intensity of physical effort is the Metabolic Equivalent of Task (MET), which is the energy cost of exercise corresponding to a multiple of the basal metabolism rate (amount of energy expended during exercise). 1 MET corresponds to the resting values of energy expended. Activities with an intensity of 1 MET are, for example, lying down, sleeping, watching TV or sitting (Nałęcz et al., 2021, p. 70).

The WHO (2020) classifies physical activity according to its level of intensity, with reference to light intensity physical activity, moderate intensity physical activity and vigorous intensity physical activity. All activities that do not exceed 3 MET units are of light intensity, including bathing or slow walking, which do not cause a significant in-

crease in heart or respiratory rate. Activities with an intensity between 1.1–2.9 MET are, among others, studying, walking, stretching or slow cycling (Nałęcz et al., 2021, p. 70).

Moderate intensity activity refers to those whose energy expenditure is between 3 and 6 MET (WHO, 2020), which is provided by brisk walking, Nordic walking, active play, cycling, recreational sports (Nałęcz et al., 2021, p. 70).

High intensity physical activity refers to those activities in which energy expenditure exceeds 6 MET (WHO, 2020), including for example: (6.0–8.9 MET): dancing, jogging, tennis, swimming, uphill cycling, martial arts, skipping. Running has an intensity above 9 MET (Nałęcz et al., 2021, p. 70).

Recommendations from the World Health Organization (2020) on the timing and intensity of physical activity for health maintenance and normal development vary by age. For children and adolescents aged 5–17 years, WHO recommends minimum physical activity of at least 60 minutes per day of moderate to high intensity, mainly aerobic physical activity. In addition, vigorous aerobic activity (strengthening muscles and bones) for a minimum of three times a week is recommended. For adults over 18 years of age, a minimum of 150–300 minutes of moderate-intensity, aerobic physical activity or a minimum of 75–150 minutes of vigorous, aerobic physical activity (or an equivalent combination of moderate and vigorous activity) per week is recommended.

Motives for undertaking physical activity

Good motivation is the basic driving force for an individual to take up and continue a sporting activity. From the perspective of promoting physical activity among children and young people, it is important to know the motives that make people undertake physical exercise.

In Poland, on the basis of *Self Determination Theory* (Deci, Ryan, 2000), a diagnostic tool was developed for pupils in grades 4–8 of primary school, which serves, among others, to diagnose motivation and demotivation in the area of physical activity (Wysocka et al., 2021).

Many motivators of physical activity are mentioned in the literature. Górczna and Garczyński (2017) reviewed Polish studies on the topic. Among the motives for physical activity, the following were prominent: health, recreation, habit and habituation, passing the time, doctor's advice, competitive approach and the need to compete with peers, the need for movement and sport-related emotions, pursuit of success, improved fitness, well-being, endurance, losing excess weight, maintaining weight, staying in shape, gaining muscle, exercise pursuing a trend, relieving stress and tension, need of companionship and contact with others, need for active leisure, seeking fun, pleasure, new experiences.

Winiarski distinguished seven motivational dispositions for recreational activity, which are related to our needs associated with a deficiency or excess of some factor, either in individuals or their environments (Fenczyn, 2005). Thus, among the motives for physical activity, we can mention (Figaj, Poczta, 2016; Winiarski, 1991): activity seeking – hedonistic motives (need for movement and pleasure), relaxation-cathartic motives (reduction of stress, tensions and negative emotions), motives related to health-hygiene (keeping fit, healthy and in good shape), emotional motives (increasing mental resistance, sensation-seeking, need of stimulation

and risk-taking), cognitive-educational motives (striving for self-improvement and development of one's passions), social motives (establishing and maintaining interpersonal contacts), personal ambition-related motives (testing oneself and improving one's self-esteem).

The results of Ley's (2020) study indicated that, among the motives for participating in sport, those linked to contact with others, health motives, aesthetic motives and activation motives are the most significant. However, the reasons for engaging in physical activity vary according to gender, age and type of sport, and duration of involvement in sport. Men are more driven than women by contacts in and through sport and by competition or performance. In contrast, women are more driven by appearance, cathartic and activation motives. Motives also differ between people who participate in individual and team sports. Those who engage in individual training without an opponent are more driven by activation, aesthetic and cathartic motives. Those who practice individual sports with an opponent are driven more by appearance and health-related motives. For people who practice team sports, on the other hand, it is the interpersonal dimension, as well as the competition and outcomes, that prove to be crucial. Furthermore, the importance of health motives increases with age when the role of interpersonal contacts in sport increases while the importance of health and physical appearance motives decreases.

Another classification of motives for participation in sports is proposed by Moradi et al. (2020) who specify achievement/status motives, teamwork motives, energy release, fitness, situational factors, skill development, friendship and fun. Basically, all motives (except friendship) were rated as more important to women compared to men, yet some gender-specific dominant motives can be also identified. For women, it is cooperation, fun and fitness whereas for men, situational factors, fun and cooperation prevail as motives for taking up sport. Cooperation and fun featured on the top of the list for both groups. In addition, all motives were rated higher by people engaged in individual sports, with the exception of cooperation, which was rated higher by representatives of team sports. It can therefore be assumed that social motives are the core motivation for team sports.

As we can see the motivation for physical activity varies and depends on both demographic factors and activity characteristics. Furthermore, undertaking a particular activity may result in natural selection for personality reasons, such as stimulation-seeking and low anxiety in high-risk sports (Soltysik et al., 2019; Tok, 2011). In addition, research findings indicate that in terms of personality athletes and individuals with high levels of physical activity are characterised by high Extraversion, Agreeableness, Conscientiousness and low Neuroticism compared to non-athletes (Haghi, 2014; Rhodes, Smith, 2006).

Psychopedagogical effects of physical activity

On the one hand, we can say that some sports (e.g. mountaineering) attract people with specific characteristics. On the other hand, however, each sport due to the specificity of its conditions and requirements can shape certain personality traits (Allen, Laborde, 2014) and skills. What is meant here is the developmental (shaping), preventive, as well as corrective impact of physical exercise being a component of the educational process.

Developmental impact of physical activity

In terms of developmental impact, engaging in physical activity can shape certain personality traits. Research (Ilyasi, Salehian, 2011) indicates that athletes who engage in individual sports compared with those involved in team sports are characterized by higher levels of such personality traits as: Extraversion, Openness to Experience and Conscientiousness, while there are no differences when it comes to Neuroticism and Agreeableness. Extraversion is a personality dimension that measures not only the quality and intensity of social relationships, but also the level of activity, energy, stimulation-seeking and ability to feel positive emotions. Presumably, individual sports are related to the characteristics of Extraversion in terms of activity, energy, and positive emotions because they require the individual to put effort towards an outcome of their actions. Moreover, in individual sports a person can only count on themselves, personal effort, competence, self-discipline and dutifulness. Failure cannot be blamed on others, hence higher-level Conscientiousness. The differences in Openness to Experience can be explained by the subdimension of Aesthetic Sensitivity, which can be related to the quality of the task (e.g. gymnastics) or technique. The quality of the two depends on individual input.

A study by Piepiora et al. (2020) demonstrated that sporting technique can determine personality traits. The study compared the personality of three groups of athletes: (i) a group with a stable kinematic structure of sporting technique (dancers), (ii) a group with a stable dynamic structure of sporting technique (swimmers), and (iii) a group with mixed sporting technique (karate). It turned out that the groups differed in the levels of Neuroticism, Extraversion, Openness to Experience and Agreeableness. However, they did not differ in the level of Conscientiousness and all three groups scored high (7 sten) on this scale. This result shows that practicing sport, regardless of the sport discipline and technique, shapes the conscientiousness trait, which manifests itself in dutifulness, diligence, reliability, care and accuracy.

The amount of time spent playing sport positively correlates with engaging in sport (Stolarski et al., 2020), which can be interpreted as a bond between a person and a physical activity which produces a sense of immersion in that activity, being also based on positive attitudes towards it (Martinez-Alvarado et al., 2016). The fulfilment of three basic human psychological needs (Deci, Ryan, 2000): the need for autonomy, competence and social relationships is a predictor of engagement in sport, with particular importance given to the need for autonomy (Martinez-Alvarado, 2006). Engagement in sport becomes an important trait as research indicates it is strongly positively related to perfectionistic pursuits (Jowett et al., 2016), and thus to the adaptive dimension of perfectionism (Piotrowski, Bojanowska, 2021; Szczucka, 2010). Adaptive perfectionism, in turn, is positively related to conscientiousness and negatively related to neuroticism (Szczucka, 2010). Also other studies have shown that personality traits such as conscientiousness and emotional stability (the opposite of neuroticism; Stolarski et al., 2020) are positively associated with higher levels of engagement in sport.

Also, due to the phenomenon of transfer in psychology, traits related to conscientiousness can be transferred to other areas of life. Thus, the development of conscientiousness will effectively influence achievement in, for example, school or work. Baumeister et al. (2007) believed that efforts to control behaviour in one area (e.g. exercise) lead to improved self-control in unrelated areas (e.g. learning, housework). The positive effects of activity are supported by studies that have indicated that physical activity was associated with improved self-regulation, and that this consequently re-

sulted in better school achievement scores (improved reading and mathematics scores in early childhood education; Becker et al., 2014).

Other research demonstrates that as little as 10 minutes of running on a treadmill increases self-efficacy, which is positively correlated with well-being and negatively correlated with fatigue (Rudolph, Butki, 1998). Physical activity provides a specific sense of control over the outcome of an activity and satisfaction with the work put in to achieve a goal. Research results also indicate that physically active people have higher levels of self-efficacy and life satisfaction, and that there is a positive relationship between the two constructs (Reigal et al., 2014). Through positive exercise experiences, people gain self-confidence and positive self-esteem. Social and physical competences and self-esteem increase after just a 4-week activity programme (Ullrich-French et al., 2012). Research findings also indicate a significant relationship between the length of experience of participating in physical activity and perceived competence (Feltz, Petlichkoff, 1983).

Physical activity also develops social competences and relationships. The positive role of physical activity in the development of communication skills has been pointed out (Khan et al., 2021), along with the fact that young people learn intrapersonal (i.e. emotion regulation, concentration, goal setting) and interpersonal (i.e. respect, responsibility, social skills) skills through sport and physical activity and apply these skills to other areas of their lives. The skills acquired are therefore transferred to other areas of life (Bean et al., 2016). Screening studies in 11–14 year olds indicate generally higher levels of social skills (especially in emotional expression, emotional sensitivity, social expression and control) in the group that chose additional sports activities compared to the group that did not choose sports activities at all (Eroglu, Demirel, 2018).

Sport and physical activity provide grounds for building social relationships with parents, peers and coaches. It can play an important role in acculturation and integration into the peer group (Doherty, Taylor, 2007). Changes in the sphere of social relationships were predictors of changes in the psychological sphere (Ullrich-French et al., 2012).

Physical activity also has a positive effect on cognitive functioning, most notably on memory and focus. Quasi-experimental data indicate that additional hours of PE do not have a negative impact on the academic performance of primary school pupils, although the time spent on other subjects usually decreases in such circumstances. In addition, increasing PE hours may result in a small but significant increase in grade point average as well as physical performance. Research shows a link between academic performance and physical activity, but not physical fitness. Given these facts, it is possible to increase the amount of PE hours at the expense of other subjects, without the risk of deteriorating academic performance. On the other hand, increasing time in 'academic' subjects at the expense of PE does not improve grades in these subjects and may prove detrimental to students' health (Trudeau, Shephard, 2008). There are voices in the literature that require a minimum of 150 minutes per week of compulsory high-quality physical education for each child (Bornstein et al., 2009).

Preventive effects of physical activity

Physical activity can also prevent undesirable health outcomes as well as cognitive, personality and behavioural changes.

During physical activity, endorphins are released (peaking after about 30 minutes of intense activity), which cause relaxation and calmness, and inhibit the production

of stress hormones. Moreover, anxiety levels decrease after about 20 minutes of moderate-intensity physical exercise (Łuszczynska, 2011). These facts show that physical activity has a preventive effect on civilisation diseases and emotional disorders.

Regular physical activity of moderate to high intensity is a protective factor against cognitive decline (dementia), including memory and learning in older people. Furthermore, although numerous health-promoting behaviours affect cognitive functioning, physical activity is the most important predictor (Łuszczynska, 2011, p. 117; Ruscheweyh et al., 2011).

Longitudinal studies demonstrate that people who engage in high levels of physical activity display a lesser decline in Conscientiousness, Extraversion, Openness to experience and Agreeableness than less active people. Physically active people have more stable and consistent personality profiles than inactive people. This indicates that physical activity may prevent undesirable personality changes (Stephan et al., 2014).

Regular exercise can also improve willpower (Pidgeon, Monteah, 2013), whereby performance related to self-control tasks deteriorates more slowly (Baumeister et al., 2007). This consequently means that exercise can shape willpower, and that willpower can be linked to health-promoting behaviours based on the ability to resist temptations and persist in resolutions (e.g. lower use of alcohol, tobacco, overeating, etc. *cf.* (APA, 2012).

As indicated earlier, physical activity improves the sense of self-efficacy, but also increases resilience. Therefore, some authors (Greco et al., 2019) indicate training (e.g. karate) as an alternative to activities aimed at preventing bullying at school.

Corrective effects of physical activity

Physical activity can perform the function of creative social rehabilitation (*cf.* Konopczyński, 2009). A number of studies indicate that sport has corrective functions for the traits and personality profiles of people with a criminal past, but it can also play a supporting role in therapeutic programmes for children and young people with various types of disorders.

A 'second chance' project was run in Portland for 81 young men (18–21 years old) who were jailed at the time. The project was based on the introduction of a 12–15 weeks programme which included intensive football, rugby and fitness training and playing matches. The results demonstrated that the participating young men showed a significant improvement in conflict resolution (lower non-compromising attitudes), better approach to crime and reduced aggressiveness and impulsivity (Meek, 2012).

A Swedish study on 152 participants in correctional institutions indicated that a 10-week intervention using a yoga programme reduced perceived stress, improved sleep quality, and increased mental and emotional well-being while also reducing aggressiveness and levels of antisocial behaviour. Attention and impulsivity control scores also improved (Kerekes et al. 2017).

Among children with ADHD, 12-week table tennis training was introduced to improve their motor skills, as well as their supervisory, control, and executive functions of cognitive activity (Stroop task, Wisconsin Card Sorting Test; Pan et al., 2019).

Also, a 12-week structured physical activity programme was used among children with Autism Spectrum Disorder (ASD). Significant improvements were reached in social interactions and communication skills (response speed and expression), cooperation and self-control (Zhao, Chen, 2018).

Summary

Physical activity has a major impact on the quality of life. Participants in randomised physical activity interventions report better health outcomes, including improved general and health-related quality of life, improved performance in a variety of daily tasks and better mood (Penedo, Dahn, 2005). In addition, exercising and engaging in sport, as well as creating favourable conditions for doing so, can reduce social exclusion and isolation, mitigate the harms associated with poverty, foster the strength of relationships in the context of resolving local conflicts and developing collective identities (Lawson, 2005).

Sport and physical activity have an important educational significance in terms of the development of desirable qualities and skills, prevention, as well as the correction of undesirable qualities and behaviour.

However, it should be noted that the commercialisation and professionalisation of sport may come into conflict with its educational idea, due to the pathologies that arise on their basis (Czechowski, 2016, pp. 173–174).

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ROLA AKTYWNOŚCI FIZYCZNEJ W WYCHOWANIU

Streszczenie: Celem artykułu jest przedstawienie wpływu aktywności fizycznej na rozwój człowieka. Zasygnalizowano związki sfery somatycznej z sferą psychiczną oraz omówiono niepokojące wyniki badań nad aktywnością fizyczną. W kolejnych częściach artykułu dokonano podstawowych rozróżnień terminologicznych oraz przedstawiono rekomendacje WHO dotyczące aktywności fizycznej, a także zaprezentowano motywy jej podejmowania.

W artykule omówiono psychopedagogiczne efekty aktywności fizycznej z uwzględnieniem jej oddziaływań rozwojowych, profilaktycznych i korekcyjnych. Wyniki badań bezsprzecznie potwierdzają, że aktywność fizyczna sprzyja holistycznemu rozwojowi człowieka i stanowi istotną składową procesu wychowania.

Słowa kluczowe: aktywność fizyczna, sport, rekreacja, wychowanie