Galician medical journal 2019
Vol. 26, Issue 2, E201923
DOI: 10.21802/gmj.2019.2.3

Public Health Service

Physioprophylaxis in Physiotherapy with Emphasis on Physical Activity

Zofia Kubińska, Ihor Mysula*, Kamil Zaworski, Agata Pocztarska-Głos

Abstract
Currently, physiotherapist's work is to provide health services to healthy and sick people. One of the types of these services is physioprophylaxis, i.e. prophylactic activity consisting in promotion of pro-health behaviours as well as development and maintenance of the fitness and endurance of people of all ages to prevent disability. The term 'physioprophylaxis', which has been familiar to physiotherapists only, has been known in Poland in the area of health culture for merely a few years. The authors of the study believe that there is a need to promote the knowledge about the role of physioprophylaxis in the area of health culture, education, science, and society. The role of physical activity in physioprophylaxis is emphasised as well.
It is evident that the legal regulations of the profession of physiotherapists are not reflected in appreciation of their comprehensive preventive and therapeutic competences in the health care system or in the general public awareness.

Keywords
physioprophylaxis; prophylaxis; physiotherapy; physical activity

John Paul II State School of Higher Education in Biała Podlaska, Poland
***Corresponding author**: mysulaigor@ukr.net

Introduction

No explanation of the meaning of the word *physioprophylaxis* can be found either in dictionaries of the Polish language or in the dictionary of physiotherapy [1]. In the general cultural milieu, the concept of physioprophylaxis appeared in 2015, when a group of experts developed and published a preliminary version of the Act on the Profession of the Physiotherapist. Therefore, the term 'physioprophylaxis', which has always been familiar to physiotherapists, has only been known in the area of health culture in Poland for several years, which however is not reflected in general public awareness [2].

The authors of the study believe that there is a need to promote the knowledge about the place and role of physioprophylaxis in the area of health culture, education, science, and society. The role of physical activity in physioprophylaxis is emphasised as well.

Contemporary legal basis of physioprophylaxis

The term physioprophylaxis has been included in the Act on the Profession of the Physiotherapist, thus conferring physiotherapists the status of medical professionals. In one of the "*principles of the physiotherapist profession practice*" specified in Article 2 of the Act, point 8 reads: "*the profession of the physiotherapist consists in providing health services,* inparticular... *8) preventive activities involving promotion of pro-health behaviours as well as development and maintenance of the fitness and endurance of people of different age to prevent dis-*

ability" [3].

The work of experts from the Polish Chamber of Physiotherapists (KIF) resulted in implementation of further legislative actions concerning the physiotherapist profession. They led to introduction of the regulation of "*a detailed list of professional activities*" [4], which included occupational task 14: "*Physioprophylactic activity*", specifying such physiotherapist's activities as "*Prophylactic activity through control of the risk factors of development of diseases*". By virtue of the next amended regulation, which has been in force since 1 January 2019, physiotherapist's competence to design the physiotherapy process has been acknowledged.

Therefore, each physiotherapist shall implement primary and secondary physioprophylaxis as part of the physiotherapy process. These two levels of prophylaxis (prevention) are present in the practical aspect of Polish medicine. In turn, physiotherapy students are required to gain theoretical and practical competence during lectures and classes in the physioprophylaxis course in accordance with the expected learning outcomes [5].

Types of prophylaxis with particular emphasis on physioprophylaxis

Prophylaxis is a word of Greek origin (*prophylaktikós*) meaning avoidance, prevention, and a set of actions and measures taken for prevention of the occurrence of undesirable and negative phenomena in nature, including the life of individuals or society [6, 7]. Prophylaxis is a domain of many fields and milieus, including sociology, psychology, pedagogy, health promotion, medicine, and school education, which supports educational activities with a school preventive program. The concepts and actions of all types of prophylaxis are focused on the unlimited human behaviours as well as their causes and specific consequences.

Social prophylaxis has two dimensions as sociological activity: socio-prophylactics and resocialization. As specified by Urban, social prophylaxis should be regarded as a set of activities aimed at creating conditions that prevent deviant development of the socio-moral sphere of individuals disrupting normatively regulated social interactions and, consequently, bringing losses in the individual and social dimension [8].

Psychoprophylaxis develops and implements programs aimed at prevention of alcoholism, drug addiction, or sexually transmitted diseases. They were implemented on a wider scale after the World War II. In terms of contemporary knowledge, it is a history of numerous errors and the resulting damage, whose scale is currently difficult to estimate. Programs must be based on a coherent theory developed in scientific research and tested repeatedly. They must also include procedures for checking their effectiveness. Psychoprophylaxis is an extremely dynamically developing sub-discipline [9]. In health promotion, which is a "process of enabling people to control and improve their own health by making pro-health choices and decisions, developing the needs and competences to solve health problems, and increasing health potential" [10], all actions for individuals and society are implemented via three types of strategies: health education, health policy, and prophylaxis. These strategies are best described by B. Wojnarowska, who emphasises that prophylaxis is one of the elements in the structure of activities aimed at solving health problems. In addition to prophylaxis, these strategies include tasks related to health education, health promotion, treatment, and rehabilitation. Each of them has its own specific goals and implementation methods. Importantly, the specificity of prophylaxis lies in its pre-emptive rather than corrective character [11].

As far as prophylaxis in medicine is concerned, Demel reported that, as early as in the 12th century, St. Thomas Aquinas wrote about two forms of medicine in his works - repair medicine (*removens*) and promotional medicine (*promovens*) [12]. Currently, prophylaxis is one of the most important tasks in the medical care provided by the general practitioner. It is implemented in relation to a wide range of diseases (e.g. infectious diseases, cardiovascular diseases, cancer, injuries, and mental health problems) and is targeted at reduction of morbidity and mortality. It is based on such methods

as vaccination, lifestyle change, and chemoprophylaxis in all age groups, regardless of the gender. The author claims that disease prophylaxis activity implemented by general practitioners, excluding specialists, was initiated 20 years ago [13].

Physioprophylaxis as a health need and medical service is now divided into primary and secondary types [2]. As defined by the Dictionary of Physiotherapy, primary prophylaxis is targeted at the entire population or risk groups, risk factors, or groups with special health care needs. Secondary prophylaxis includes actions taken when the first symptoms of the disease or dysfunction have appeared. It is expected to prevent the consequences of the disease or to slow down (mitigate) the development of yet invisible but predictable symptoms that, in their developed form, usually constitute a major obstacle for further rehabilitation [1].

Authors of scientific medical considerations provide various classifications of preventive measures. The example in Table 1 shows four levels of prevention hypertension in the elderly.

Physical activity in physioprophylaxis

As already mentioned, it has been specified in the Act on the Profession of the Physiotherapist that the professional duties of a physiotherapist include prophylactic activity consisting in promotion of pro-health behaviours as well as development and maintenance of the fitness and endurance of people of all ages to prevent disability. Pro-health behaviours are components of a healthy lifestyle, with physical activity mentioned in the first place by Woynarowska [11].

The development of civilisation through technical progress has significantly contributed to the reduction of the frequency and intensity of physical activity [15]. In turn, the prevalence of sedentary lifestyle is constantly increasing in all age groups. Only 30% of adolescents and 10% of adults participate in regular physical activity than meets their health needs [16, 17].

The impact of physical activity on the organism function can be considered in many aspects. With its range, it can exert a local effect on tissues or a systemic impact on the organism. In terms of the types of health benefits, it has pre-emptive (prophylactic) and therapeutic effects allowing recovery. Prophylaxis is also associated with the maintenance and enhancement of the current morphological and functional status, while therapy involves minimisation of the range of adverse disorders accompanying disease processes. The therapeutic value of physical activity is related to restoration of normal functions of the organism. If this is impossible, it leads to development of compensation and adaptation mechanisms [18, 19]. Physical effort exerts a holistic effect on the human organism, with a special contribution to the locomotor, circulatory, respiratory, and neurohormonal system (and many internal organs) [18, 19].

Physical activity in children accelerates conversion of cartilage into bone tissue, thus stimulating the growth process and preventing defects of the musculoskeletal system [20]. Exercises influence the nourishment, flexibility, elasticity, and endurance of joints (joint capsules, ligaments) [18, 19]. During adolescence, physical effort significantly strengthens the bone structure and sufficient mineralisation prevents osteoporosis [21, 22, 23]. It also contributes to an increase in muscle weight and stimulates morphotic changes in the tissue, i.e. improved tissue perfusion, improved flexibility, and consequently maintenance of the proper range of motion in joints.

Physical activity is a source of stimuli for the nervous system via its developmental and corrective effect on the function of this system. It also plays a fundamental role in teaching locomotor skills and is the basis for formation and sustenance of locomotor patterns. Regular training results in better neuromuscular coordination, i.e. intentional involvement of muscles to perform a given movement and more efficient performance at lower energy costs [20]. Physical training also delays the processes of dementia and progress of Alzheimer's disease [24].

One of the most important benefits of regular physical activity is the reduction of the risk of cardiovascular disease. Direct effects of training include hypertrophy of the myocardium, improved

Table 1. Classification of preventive measures with examples of activity [14]

Type/level of prevention	Aim of measures	Type of activities in hypertension in the elderly
Primordial	Control of single risk factors	Body weight control, increased physical activity, healthy diet, no smoking
Primary	Prevention of disease	Comprehensive education aimed at maintenance or restoration of a healthy lifestyle
Secondary (early)	Identification of the disease in its early asymptomatic stage	Screening and implementation of medical treatment
Tertiary (late)	Prevention of disease complications	Pharmacotherapy, non-pharmacological treatment
Quaternary	Prevention of unfounded or harmful medical activities	Avoidance of unnecessary examinations (screening) Avoidance of ungrounded pharmacotherapy and polypharmacy

cardiac muscle contraction, increased stroke volume and cardiac output, and reduced heart rate. Physical activity reduces resting blood pressure, improves the lipid profile, reduces obesity, and influences endothelial function, inflammatory processes, the coagulation system, and sex hormone levels [18, 19, 20, 25, 26, 27].

Regular physical activity in children supports the development of the chest structure and the activity of respiratory muscles. The respiratory system undergoes two phases of adaptation to physical effort. One of these phases consists in increasing lung ventilation via sensory stimuli reaching the respiratory centre from the working muscles and joints. The other phase is associated with sensory activity in response to changes in temperature and partial pressure of respiratory gases [20]. Training increases the basic respiratory parameters, which results in better tissue oxygenation and improvement of physical performance [18, 19, 27]. Systematic motor activity may slow down the natural rate of changes in the respiratory system, influence the respiratory rhythm, improve the ventilation-to-perfusion ratio, counteract sarcopenia, strengthen the respiratory muscles, and improve the mobility of the chest [28, 29].

Physical exercise has a beneficial effect on the immune system as well. Exercises trigger changes in immune mechanisms, i.e. they primarily increase the blood levels of IgG, IgM, enhance the production of cytokines IL-2, IL-4, and IFN-γ, and increase the number of TH cells. Higher intensity of physical activity may reduce the number of episodes and days with symptoms of respiratory tract infections [30, 31, 32].

Physical activity also exerts a positive effect on the endocrine system. By supporting the structure and activity of the pituitary gland, it contributes to intensification of physical development [24] through enhancement of growth hormone (TSH) and dopamine secretion and reduction of the blood insulin concentration. Regular exercise contributes to glycaemic control, increases muscle glucose uptake, and reduces body weight in obese patients [19, 32]. In turn, improvement of intestinal motility and reduction of constipation are the benefits for the gastrointestinal tract [32].

Regular physical activity has a preventive effect on mental health. It contributes to resolution of symptoms of depression and anxiety and improve-

ment of mental condition and psychological well-being by increasing the concentration of endorphins in blood [33, 34, 35].

The idea of physical activity as the primary preventive and therapeutic agent in Poland has been developed by Anna Plucik-Mrożek. Together with Małgorzata Perl, they are the leaders of the Exercise in Medicine (EIM) project [36]. The EIM Poland Centre was officially established on June 1, 2017. Its mission is to recognition of physical activity in Poland as the best and cheapest way to prevent chronic diseases and as a standard of treatment of these diseases (EIM). This idea is evidently consistent with the tasks of physical activity-based physioprophylaxis [36].

Summary

The only type of prophylaxis in Poland financed by the state is prevention of cancer. The president of KIF (National Chamber of Physiotherapists) Maciej Krawczyk speaks on behalf of physiotherapists (interview, 2018) "We want the National Health Fund and the Ministry of Health to subsidise physioprophylaxis. Although ministers and professors of all medical disciplines realise that prevention is the most important and cheapest strategy in medicine, no one puts it into practice" [36]. Modern physiotherapy is focused on healthy patients, patients at risk, and diseased subjects, but not everyone is aware of the range of the prophylactic, therapeutic, and rehabilitation skills of physiotherapists. In another interview (2019), M. Krawczyk states that "today it is difficult to find a health area where physiotherapy would not apply,... it is relevant to almost all areas of medicine, which many physicians and decision-makers do not realise... and some of them do not have full knowledge about the possibilities of modern physiotherapy" [37]. Without understanding this situation by public health policy makers and without providing finances, physiotherapy will continue to function as a commercial service. Therefore, the question arises: how to change this unfavourable situation for the entire society and, in particular, for post-operative patients or those that have undergone treatment and can recover only with the help from a physiotherapist (secondary physioprophylaxis). Unfortunately, there are no simple and immediate solutions changing the awareness and established health and medical procedures. Legal regulations of the profession of physiotherapists are not reflected in appreciation of their comprehensive preventive and therapeutic competences in the health care system or in the general public awareness. Therefore, physioprophylaxis should become part of health education at various stages of schooling.

References

[1] Klukowski KS, Nowotny J, Czamara A,(red. nauk.) Słownik Fizjoterapii Wydawnictwo Lekarskie PZWL, Warszawa 2014.

[2] Kubińska Z., Zaworski K.: Fizjoprofilaktyka jako potrzeba i świadczenie zdrowotne. Podstawy teoretyczne. Fizjoter Pol 2018; 18(2): 58-68

[3] Dz. U.2015 poz. 1994 USTAWA z dnia 25 września 2015 r. o zawodzie fizjoterapeuty, Kancelaria Sejmu (05.12.2018), https://kif.info.pl/ustawa-o-zaw.

[4] Dz. U. RP z dnia 9 lipca 2018 r. poz. 1319, Rozporządzenie Ministra Zdrowia w sprawie szczegółowego wykazu czynności zawodowych fizjoterapeuty http://prawo.sejm.gov.pl/isap.nsf/download.xsp/

[5] Wykaz Efektów Kształcenia Po Ukończeniu Jednolitych Studiów Magisterskich Na Kierunku Fizjoterapia w oparciu o zalecenia komisji ds. Edukacji Przeddyplomowej i PEF przy KIF.

[6] Śliwa S. Profilaktyka pedagogiczna. Wyższa Szkoła Zarządzania i Administracji w Opolu. 2015.

[7] Czarnecka A. Redefinicja społecznej funkcji profilaktyki, Profilaktyka Społeczna i Resocjalizacja. 2015, 25. ISSN 2300-3952.

[8] Urban B. Teoretyczne wyznaczniki systemu profilaktyki społecznej w środowisku lokalnym W: Dorota Rybczyńska (red.) Ciągłość i zmiana w obszarze profilaktyki społecznej i resocjalizacji Kraków Oficyna Wyd. Impuls. 2003; 21-24.

[9] Szymańska J. Programy profilaktyczne Podstawy profesjonalnej psychoprofilaktyki, Ośrodek Rozwoju Edukacji Warszawa. 2012.

[10] Promocja zdrowia, Karta Ottawska, Wikipedia https://pl.wikipedia.org/wiki/Promocja_zdrowia

[11] Woynarowska B. Edukacja zdrowotna. Wyd. Naukowe PWN. W-wa. 2017; p. 107-119.

[12] Demel M. Z dziejów promocji zdrowia w Polsce Tom III. AWF im. Bronisława Czecha w Krakowie. Kraków. 2000; 57-61.

[13] Tomasik T. Prewencja chorób układu krążenia w podstawowej opiece zdrowotnej. Zdrowie Publiczne i Zarządzanie. 2014;12 (4): 338-351.

[14] Grodzicki T. Zasady postępowania w nadciśnieniu tętniczym w wieku podeszłym, Gerontologia Polska. 2012; 20(4): 119-147. ISSN 1425-4956.

[15] Drygas W, Piotrowicz R, Jegier A, Podolec P. Aktywność fizyczna u osób zdrowych. Forum Profilaktyki. 2008; 3 (12).

[16] Kantomaa MT, Tammelin TH, Demakakos P, Ebeling HE, Taanila AM. Physical activity, emotional and behavioural problems, material education and self-reported educational performance of adolescents. Health Educ Res Advence. 2009; 10: 1093.

DOI: https://doi.org/10.1093/her/cyp048 [PMid:19762353]

[17] Wojtczak A. Zdrowie publiczne. Wyzwaniem dla systemów zdrowia XXI wieku. Wydawnictwo PZWL. 2009.

[18] Nowotny J. Podstawy Fizjoterapii. Tom I. Wydawnictwo Kasper. Warszawa. 2004.

[19] Górski J. Fizjologia wysiłku fizycznego. PZWL Wydawnictwo Lekarskie. Warszawa. 2011.

[20] Wojtasik W, Szulc A, Kołodziejczyk M, Szulc A. Wybrane zagadnienia dotyczące wpływu wysiłku fizycznego na organizm człowieka. Journal of Education, Health and Sport. 2015; 5(10): 350-372.

[21] Janiszewska M, Kulik T, Dziedzic M, Żołnierczuk-Kieliszek D, Barańska A. Osteoporoza jako problem społeczny - patogeneza, objawy i czynniki ryzyka osteoporozy pomenopauzalnej. Probl Hig Epidemiol. 2015, 96(1): 106-114.

[22] Szczepaniak R, Brzuszkiewicz-Kuźmicka G, Szczepkowski M, Pop T, Śliwiński Z. Ocena aktywności ruchowej i sprawności fizycznej kobiet po 65 roku życia ze zdiagnozowaną osteoporozą. Doniesienia wstępne. Przegląd Medyczny Uniwersytetu Rzeszowskiego i Narodowego Instytutu Leków w W-wie. Rzeszów. 2014; 1: 62-73.

[23] Podbielska M, Sokołowski K, Sokołowska M. Ocena poziomu wiedzy na temat osteoporozy i stosowanej profilaktyki wśród kobiet po 50 roku życia. Zeszyty Naukowe WSSP. 2013; 17: 87-96.

[24] Biernat E. Aktywność fizyczna w życiu współczesnego człowieka. E-Wydawnictwo NCBKF. 2014; 1-4.

[25] Makowiec-Dąbrowska T. Wpływ aktywności fizycznej w pracy i życiu codziennym na układ krążenia. Forum Medycyny Rodzinnej. 2012; 6(3): 130-138.

[26] Guszkowska M, Anna Kozdroń A. Wpływ ćwiczeń fizycznych na stany emocjonalne kobiet w starszym wieku. Gerontologia Polska. 2017; 2: 71-78.

[27] Straburzyński G, Straburzyńska-Lupa A. Fizjoterapia. PZWL Wydawnictwo Lekarskie. Warszawa. 2003.

[28] Kozak-Szkopek E, Galus K. Wpływ rehabilitacji ruchowej na stan układu oddechowego kobiet w podeszłym wieku. Gerontologia Polska. 2010; 18(4): 201-206.

[29] Prączko K, Kostka T. Aktywność ruchowa a występowanie infekcji górnych dróg oddechowych u osób starszym wieku. Gerontologia Polska. 2016; 13(3): 195-199.

[30] Pedersen BK, Hoffman-Goetz L. Exercise and the immune system: regulation, integration, and adaptation. PhysiologicalReviews. 2000; 80: 1055-1081. DOI: https://doi.org/10.1152/physrev.2000.80.3.1055 [PMid:10893431]

[31] Yan H, Kuroiwa A, Tanaka H, Shindo M, Kiyonaga A, Nagayama A. Effect of moderate exercise on immunesenescence in men. Eur. J. Appl. Physiol. 2001; 86: 105-111. DOI: https://doi.org/10.1007/s004210100521 [PMid:11822468]

[32] Gębka D, Kędziora-Kornatowska K. Korzyści z treningu zdrowotnego u osób w starszym wieku. Probl Hig Epidemiol. 2012; 93(2): 256-259.

[33] Wojtyła-Buciora P, Marcinkowski JT. Aktywność fizyczna w opinii młodzieży licealnej i ich rodziców. Probl Hig Epidemiol. 2010; 91(4): 644-649.

[34] Brunes A, Augestad LB, Gudmundsdottir SL. Personality, physicalactivity, and symptoms of anxiety and depression: the HUNT study. Soc Psychiatry Psychiatr Epidemiol. 2013; 48(5): 745-756. DOI: https://doi.org/10.1007/s00127-012-0594-6 [PMid:23052425]

[35] Ensari I, Greenlee TA, Motl RW, Petruzzello SJ. Meta-analysis of acute exercise effects on state anxiety: an update of randomized controlled trials over the past 25 years. Depress Anxiety. 2015; 32(8): 624-634. DOI: https://doi.org/10.1002/da.22370 [PMid:25899389]

[36] Chmielowska M: Chcemy, aby NFZ i MZ opłacało fizjoprofilaktykę. Rozmawa prezesa KIF Macieja Krawczyka z Medexpressem, 2018.

www.medexpress.pl/chcemy-aby-nfz-i-mz-oplacalo-fizjoprof
69931.

[37] Lisowska K, Prof. Krawczyk. Samodzielność stwarza przed fizjoterapeutami kolejne wyzwania, Rynek Zdrowia. 2019.

Received: 2019-04-01

Revised: 2019-05-08

Accepted: 2019-05-11