

Digitalization and physical activity in the aspects of health and physiotherapy. Using digital methods to improve physical fitness

EWA WODKA-NATKANIEC¹ , JUSTYNA SÓWKA² , JOANNA SKOCZEK-SYGIET¹ ,
JOANNA ZYZNAWSKA^{1,3} 

¹ Department of Physiotherapy, Institute of Physiotherapy, Faculty of Health Sciences,
Jagiellonian University Medical College, Kraków, Poland

² Orthopedics and Physiotherapy Clinic, Faculty of Health Sciences,
Jagiellonian University Medical College, Kraków, Poland

³ Centre for the Development of Therapies for Civilization and Age-Related Diseases,
Jagiellonian University Medical College, Kraków, Poland

Corresponding author: Ewa Wodka-Natkaniec, Ph.D.

Department of Physiotherapy, Institute of Physiotherapy, Faculty of Health Sciences
Jagiellonian University Medical College, Kraków, Poland

ul. Badurskiego 19, 30-962 Kraków, Poland

Phone: +48 500 279 950; E-mail: ewa.wodka-natkaniec@uj.edu.pl

Abstract: Background: An important task also faces “lifestyle medicine”, in connection with the development of IT services and digital possibilities. Practicing physical activity is an important basis for improving the physical and mental condition of patients. The aim of the work was to determine the usefulness of remote and digital forms to improve physical fitness in currently diverse groups of respondents.

Material and Methods: A review of scientific literature was conducted based on popular science databases Medline, PubMed. Only articles from the last 8 years (2017–2025.03) were taken into account. The search criteria were the following phrases: digital health, sport, physiotherapy, activity. 32 studies containing the above phrases in keywords and article content were included in the study. Papers not related to physical activation or physiotherapy through digital or remote form were rejected.

Results: Almost all studies indicated the usefulness of digital physical activation and, through it, improving physical fitness in various types of subjects. Two of the studies indicated that digital activation should be additionally personalized for specific groups of subjects and that the integration of e-exercise with the stationary form should be improved or e-coaching should be used. One study did not ultimately confirm the effectiveness of the digital physical activation program due to COVID-19.

Conclusions. It is necessary to optimize the recommendations of online exercise programs and expand existing programs for different groups of exercisers. Digital activation of movement: improves physical fitness, eliminates stress, helps to shape movement habits, is a form of relaxation or fun, is a form of encouragement and motivation, allows to monitor changes or progress of health.



Keywords: e-Health, digital health, online platforms, physical activity, muscle-strengthening exercise.

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Introduction

Practicing physical activity is an important basis for improving the physical and mental condition of patients [1, 2]. Physical exercises stimulate and improve the functioning of the immune, respiratory, neurological and circulatory systems [1, 3, 4]. In addition, the health-promoting effects of physical exercises include increasing the efficiency of the musculoskeletal system and reducing excess body weight.

In the last decade, IT services and digital capabilities have developed, which are used in the area of improving the health of patients and motivating them to exercise [5–7]. Digitization — a term derived from the English “Digital Health”, i.e. digital physiotherapy — is becoming an increasingly popular method. It has gained particular value, especially after the events of recent years, when restrictions related to the COVID-19 pandemic appeared [5, 7, 8].

It is worth noting that due to SARS-CoV-2, numerous difficulties and limitations have arisen regarding direct medical and physiotherapy visits. Restrictions on social life, limited number of face-to-face medical visits, limited possibility of using group exercises in rehabilitation clinics, suspension of activity in sports centers and gyms, have resulted in reduced available forms of physical activity, both sports, recreational and health-promoting [2, 5, 9–11]. It is important that WHO recommended regular physical activity as an important element of patients’ recovery during and after COVID-19 treatment [12]. In response to the effects of COVID-19 restrictions, remote consultation methods and digital programs activating physical exercise have been promoted. Attempts were made to encourage people to be active in sports using social media, videos and photos of athletes [5, 7, 13].

Despite the lifting of restrictions related to COVID-19, there is still a group of people with disabilities and patients who still require a comprehensive approach to therapy, including remote activation for physical exercises. Nowadays, during recovery from illness, difficulties may be the large distance of the office from the place of residence, lack of time, difficulties in reaching appointments at a specific time, e.g. due to lack of transport or bad weather conditions. This results in a lower frequency of visits to the physiotherapist, slower recovery and limitation of optimal health care, as well as minimization of physical activity.

The answer to these difficulties and the lack of motor activation may be telephysiotherapy [8, 14], including movement exercises conducted and performed remotely [7]. A series of continuous digital physiotherapy, combined with periodic stationary visits or consultations, may be a good alternative for patients who are limited in time and have difficulty moving. There is an increasing demand for the use of remote and digital forms to determine, select and increase appropriate physical activity in patients [14]. Therapies using digitalization may include two main approaches: devices with applications or digital platforms. Digital devices include those that support diagnostics, monitoring and training of the musculoskeletal system. Remote platforms and digital programs have also been introduced that motivate patients to exercise. Thanks to the growing popularity of the Internet and its widespread availability, patients can use remote physical exercise programs on a daily basis [7, 14, 15].

Diverse patient groups indicate a wide range of applications of digitalization in physical therapy. However, the scientific literature lacks a review article on the use of digital forms of activation for movement. The following systematic review aims to help develop optimal physical therapy methods that include additional digital activation for physical exercises among different populations of athletes — both professional and recreational — and patients.

The primary objective of the study was to determine the usefulness of remote forms (digitization, archiving of data on electronic platforms and their subsequent use to improve the patient's health) and digital forms (digital technologies affecting society) in order to improve physical fitness (the use of activation for physical exercises in digital or remote form during the last 8 years).

The additional goal was to find and define digital tools (telephysiotherapy devices and programs) that can be used in digital physiotherapy or serve to optimize it. Another sub-goal was to select the population of respondents for whom remote physical exercise methods are recommended with positive results.

Materials and Methods

The following work takes into account research and scientific works indicating the use of remote platforms and digital tools taking into account the activation of movement, also during diagnostics, therapy, monitoring and the inclusion of physical exercises.

Search strategies, assignment and quality assessment of studies

A review of scientific literature was conducted based on popular science databases — Medline, PubMed, associated with Google Scholar. Articles from the last 8 years were taken into account: 2017–2025 (mars). The authors jointly defined and selected keywords, the same for each of the searched databases. Ultimately, the search criteria were: digital health, sport, physiotherapy, activity. 337 search results were obtained in PubMed taking into account all types of scientific works/articles (Books and Documents, Clinical Trial, Meta-Analysis, Randomized Controlled Trial, Review, Systematic Review). The following articles were eliminated from them: Systematic Review and Books and Documents type articles, to obtain pools of clean/transparent studies on the use of digitization in specific people. As a result of this action, 110 works were obtained for review in PubMed.

Table 1. Criteria for search, review and qualification of works – characteristics of qualitative data.

Strategy	Description
Age	children, adolescents, adults, and seniors
Population	Any group of participants: athletes, healthy individuals and those with dysfunctions, patients
Forms of movement activation	Recommendations from e-databases Digital/Remote Platforms and Programs Digital Devices
Results	Digital/Remote Physiotherapy and the Possibilities of Using Digital Activation for Physical Exercise in Different Populations

Ultimately, 32 papers containing the above-mentioned terms in the keywords and the article content and corresponding to the authors' searches were included in the study. Papers not related to physical activation or physiotherapy via digital or remote form were rejected. The selected scientific papers were assigned to two subsections: devices with digital software and telephysiotherapy. The qualitative search strategy is presented in Table 1.

Qualification process

Assessment of the selection and quality of studies was performed by all review authors. Qualification criteria included original studies, meta-analyses, review articles published in peer-reviewed journals, and inclusion of similar works. The language of publication and methodological quality regarding research tools or statistical methods used were not taken into account during the withdrawal or qualification process. Due to the methodological diversity of the studies selected for the review, it was not possible to perform statistical calculations determining the relationships between the obtained results.

Results

Number of papers and diversity of the study population

The search yielded 34 papers that indicated the use of remote techniques and digital tools during the study.

The study groups included: healthy individuals, individuals with increased body mass, athletes, and cardiology, gynecology, neurology, orthopedics, nephrology, and patients with disease states and geriatric changes (Table 2).

Table 2. Number of research works and number of respondents who used digital methods.

Population	Authors	Number of articles
Healthy individuals	Hollingsworth <i>et al.</i> (2020) [16] van Sluijs <i>et al.</i> (2021) [17] Parker <i>et al.</i> (2021) [7] Muradyan <i>et al.</i> (2022) [1] Doherty <i>et al.</i> (2024) [18]	5
Athletes	Patterson <i>et al.</i> (2022) [19] Vargas-Molina <i>et al.</i> (2021) [20]	2
Cardiac patients	Hansen <i>et al.</i> (2018) [21] Zelko <i>et al.</i> (2018) [22] Frederix <i>et al.</i> (2015) [23] Luijk <i>et al.</i> (2024) [24] Fanaroff <i>et al.</i> (2024) [25]	5
Cardiac and oncological patients	van Dijk-Huisman <i>et al.</i> (2024) [26]	1
Gynecology patients	Lutfi <i>et al.</i> (2018) [15] De Marco <i>et al.</i> (2021) [27]	2
Neurologic patients	Bishnoi <i>et al.</i> (2022) [28]	1

Population	Authors	Number of articles
Orthopedic patients	Kloek <i>et al.</i> (2020) [8] Nelligan <i>et al.</i> (2021) [29] Nelligan <i>et al.</i> (2021) [30] Merolli <i>et al.</i> (2021) [6] Shear <i>et al.</i> (2023) [31] Dieter <i>et al.</i> (2024) [32] Weber <i>et al.</i> (2024) [33]	7
Nephrology patients	Walklin <i>et al.</i> (2023) [34] Young <i>et al.</i> (2024) [35] Greenwood <i>et al.</i> (2024) [36]	3
Pulmonary patients	Zanaboni <i>et al.</i> (2023) [37]	1
Seniors	Campo-Prieto <i>et al.</i> (2022) [14] van den Helder <i>et al.</i> (2018) [38] Mollà-Casanova <i>et al.</i> (2023) [39]	3
Alzheimer's disease	Watts <i>et al.</i> (2024) [40]	1
Individuals leading a sedentary lifestyle with HIV	Bonato <i>et al.</i> (2023) [41]	1
Total		32

Digital tools used

Among the digital physiotherapy tools, we can distinguish diagnostic, monitoring, rehabilitation or those that have several functions combined. The digital-remote methods shown in the reviewed works are presented in Table 3 and described in detail in the results analysis subsection.

Table 3. Types of digital tools used in the reviewed scientific works.

e- DIAGNOSTICS			e-ACTIVATION / e-THERAPY	
Databases	Measurement	Monitoring		
Digital platforms containing databases of patients and their ailments	Small and easily accessible digital devices	Diagnostic tools available in offices based on digitalization	Digital exercise programs	Online and related services
Selection of an individual physical activity program by the system e.g. EXPORT	Pedometer Accelerometer Digital Pulse Meter	Digital platforms dynamometric, dynamographic, etc. (foot loads, center of gravity settings); Digital manometry; BIODEX — treadmills (measurements of movement parameters)	Online e.g. YouTube Applications Games Specially recorded exercise sets Teletherapy	Training Education Coaching meetings Teleconsultations Remote monitoring of the patient's health

Analysis of results

Digital devices and methods for motor activation and improvement of physical fitness

Among physiotherapy digital tools, we can distinguish diagnostic, monitoring, rehabilitation or those that have several functions combined.

Special platforms are used diagnostically to assess physical activity and injury, i.e. electronic databases of supervision, online surveys. On the other hand, electronic devices with appropriate applications or software are used.

Accelerometers and pedometers are installed in mobile phones and smartphones. This is a form of digital tools that are easily accessible and do not generate economic costs. They can be used to support physiotherapy by determining the number of steps taken in a given time, measuring movement, or more precisely linear and angular displacements, which translates into physical activity performed. Interventions to improve the supervision of physical activity were determined in various countries, i.e. the USA, Malta, Portugal, Norway, Australia. Based on accelerometers (worn around the waist or wrist) and pedometers, it was found that men are more active than women. Additionally, a clear tendency was observed for the level of physical activity to decrease with age (10–24 years), especially during puberty. On the other hand, in young adulthood, the level of physical activity is more stable [17, 42].

Health problems, cardiometabolic problems related to obesity increasingly affect young people who avoid doing sports. Researchers state that 80% of young people are too inactive and spend more and more time (at least two hours) in front of a phone or computer screen. They confirm that it is necessary to improve the supervision of physical activity of teenagers. A form of encouragement, apart from the multifunctional urban, social and school environment, is the development of digital games that engage in physical activity. The social and digital environment is important for young people, and digital games can be used to improve physical fitness [17]. Additionally, it seems that the use of digital games with a biofeedback function increases the possibilities of physiotherapy in young people.

Hollingsworth *et al.* [16] used three- and six-month specially prepared exercise programs to increase sports activity in untrained individuals. The researchers trained the participants in person but also used digital coaching for the duration of the study. The form of digital assistance supported the formation of sports habits and motivation, and digitalization facilitated contact, providing a quick opportunity to visualize and correct irregularities in the trained movement [16].

Parker *et al.* [7] confirm that digital platforms were conducive to supporting physical activity among Australian adolescents and adults, especially during the COVID-19 restrictions. It should be emphasized that maintaining physical activity at home is important, especially for people who are forced to stay at home, are dependent, cannot travel longer distances, and also due to other limitations related to dysfunction or disease. In order to maintain physical activity at home, digital platforms were used, including physical exercises, such as: YouTube, Instagram, Facebook, fitness programs (subscribers, online, applications), live online classes e.g. via Zoom, sports-specific applications, active electronic games (Kinect, Xbox), online or digital training platforms, etc. It has been shown that digital platforms are a good alternative to engaging in physical activity for people who have limited access to exercise outside the home [7].

Doherty *et al.* [18] evaluated the impact of the Samsung I80 BPM app, designed for physical exercise, and the effectiveness of the program in terms of user satisfaction. The app personalized

physical exercise over a 12-week program. The results showed that participants exercised more often and with greater intensity, and the use of artificial intelligence (Reinforcement Learning (RL) that personalized the exercise program increased their engagement and satisfaction. The authors emphasize that digital tools such as the Samsung I80 BPM app have great potential to promote physical activity and improve health. The study shows that digital tools can effectively motivate physical activity and improve health, encouraging further research to spread physical activity in society. The authors encourage further research using this program to improve the health of the population [18].

Nelligan *et al.* [29] proposed digital physical therapy programs (physical activity and strengthening exercises) for patients with knee osteoarthritis. The authors' results confirm that their 24-week web-based strengthening exercise regimen and automated text messages for encouragement and recommendations for exercise reduced pain and improved knee function after 6 months [29, 30]. The use of computer-based techniques is positive for patients and may also support clinicians in providing exercise management. The results of Nelligan *et al.* [29, 30] are encouraging, suggesting the need for building digital physical therapy websites for different groups of patients with limited mobility.

Kloek *et al.* [8] evaluated the value of a three-month web-based e-exercise program in patients with knee and hip osteoarthritis. E-exercise was used in patients who were considered to be useful. Patients' e-activity recommendations were determined by time, workload, professional autonomy, environmental factors, and financial implications. Physiotherapists who prescribed e-exercise had mixed experiences. It was concluded that there is a need to improve the integration of e-exercise with physiotherapy and to tailor it to individual patient needs [8].

Weber *et al.* [33] also described the effectiveness of a mobile app-based educational program for patients with knee and hip osteoarthritis. The program, entitled "Join the Movement," developed as a web-based platform, was evaluated in the Netherlands. Its main goals were to improve the usability of the app and reduce pain. The program lasted 12 weeks, and most participants used the app more than three times per week. The results showed that the app was acceptable to the study group and resulted in clinically significant pain reduction in the intervention group. However, no significant effects were observed in terms of increasing physical activity. The authors note that the use of the app in the short-term treatment of patients with osteoarthritis (OA) may be a promising tool in the future care of these patients, although it requires further development and optimization. The digital program, despite some limitations, shows the potential of remote technologies for improving health and pain management in people with chronic joint diseases [33].

The Hospital Fit smartphone app combined with an accelerometer has been shown to improve physical activity in Dutch oncology and cardiology patients. Continuous monitoring and reminders sent by the app made patients more motivated, aware and engaged in physical activity. The average time spent walking increased by 20 minutes compared to patients not using the app. Despite the longer walks, no statistical difference was achieved in the average time spent standing, lying down, sitting or changing body position. The results of this study should be interpreted with caution because, according to the authors, a sufficiently large sample size may have been achieved. Patients and healthcare professionals felt that Hospital Fit improved physical activity behaviour and recovery in patients. Insufficient digital skills and technical problems were described as challenges. This informs future manufacturers and users of such physical activity equipment to simplify the instructions and operation of digital devices, introduce more training in the use of such devices, and also introduce familiarity with such technical innovations [26].

Fanaroff *et al.* [43] conducted a study on the effect of treadmill exercise on functional capacity in patients with peripheral arterial disease (PAD). The GAMEPAD program was a 16-week controlled behavioral study aimed at increasing the daily physical activity of patients. The program involved 15 minutes of walking at a pain-free pace, gradually increasing to 30–60 minutes per day. The study showed that it is the first virtual program that can be implemented at home without specialist care. The goal was to increase the number of steps without interruption during pain, which was achieved in many patients. The authors emphasize that the GAMEPAD program may be particularly effective for patients with limited activity due to symptoms of exertion [43].

Hansen *et al.* [21] conducted a review of the scientific literature on cardiovascular disease (CVD) risk and prevention. The authors note the role of the Exercise Prescription In Everyday Practice & Rehabilitative Training (EXPERT) tool in optimizing exercise for patients with CVD [21]. Zelko describes EXPERT as an “interactive digital training and decision support system to optimize exercise prescriptions for patients with cardiovascular disease.” The exercise prescription is generated based on a detailed review of the patient’s diagnosis, prognosis, complications, and medications. The exercises are tailored to the patient and vary in intensity, frequency, feasibility of strength training during the program, duration of each session, and duration of the entire training program [22].

The authors [22] draw attention to the effectiveness of digital tools in the form of EXPERT databases and remote training. They encourage patients with cardiovascular problems to be prescribed exercises in this digital system. Thanks to the cardiology patient’s data included in the EXPERT digital program, the system optimally adjusts the activity for the patient, taking into account the recorded comorbidities, cardiology diagnosis and medications. It seems, therefore, that “digital tips” are valuable and support the patient’s daily physical activity accordingly. Summing up the results presented by Zelko *et al.* [22], it was confirmed that the EXPERT digital system can be safely used to optimize exercise recommendations for cardiology patients.

Circulatory problems, hypertension can be associated with stress. Studies on stress are equally important, and digital methods should be used to reduce it, but also to assess its impact on the patient’s psychophysical state. On the other hand, Muradyan *et al.* [1] note that regular physical activity is associated with the feeling of stress. To determine the level of stress, researchers used the digital Multiscan BC-OXI device (determining the multi-frequency segmental body composition during 3D analysis with a digital pulse oximeter). Their studies showed that key indicators of stress and well-being were significantly improved by regular physical activity and that parasympathetic activity showed significant changes as a potential stress biomarker [1].

It should be noted, however, that older people rarely follow the recommendations for regular physical exercise. Campo-Prieto *et al.* [14] proposed a 10-week digital training for this group of subjects as a supplement and alternative to physical activity. The researchers used a digital, immersive video game (BOX VR) in people of average age 85 (to increase their physical activity). People had a choice of different virtual environments, i.e. the seabed (the Blue — a game based on the observation of the seabed: a shipwreck, coral reef, ocean depths) or a house in the mountains (Steam VR Home — portrays an environment located in a house in the mountains), where they performed activities assigned in the game. According to the authors, the digital intervention was a feasible method with an appropriate approach to a personalized exercise program. The results indicated effectiveness, and therefore improvement of physical functions in older people exercising through the game. The verification tests included: sit-stand test, gait, Timed Up and Go test, Tinetti balance test, general assessment of fitness [14].

Telephysiotherapy, teleactivation

Physiotherapy methods to improve physical fitness remotely are becoming increasingly popular. Due to the limited movement of people with mobility impairments, the desire to minimize the time to reach the office and the need for a quick visit, multidirectional digital methods are used.

Thanks to telecommunications between the researcher and the examined, the supervisor and the treated, it is possible to quickly monitor progress, patient care. In telephysiotherapy, remote physiotherapy programs, specially created pages/domains, internet consultations or digital coaching appear. It should be noted that the form of telehealth refers to remote services, both non-clinical (training, meetings, education) and clinical, i.e. telemedicine. Currently, telehealth is most often used in various forms as: live video, storage and transmission of data (e.g. exercise programs), remote monitoring of the patient's condition and mobile health (as live video, store-and-forward, remote patient monitoring and mobile health).

Lutfi *et al.* [15] used digital methods of motor activation in women with endometriosis. The study groups performed physical exercises to reduce pelvic pain using two methods: a self-paced virtual reality (VR) technology based on a game, with 3D glasses in a free-form training environment, and a supervised exercise delivered via telehealth. The authors suggest that a single bout of "self-managed" exercise delivered via VR may be as effective as a single session of "supervised" exercise delivered via telehealth, providing immediate relief from pelvic pain associated with endometriosis [15].

De Marco *et al.* [27] used digital manometry to assess pelvic floor muscle training (PFMT) in women during maximal voluntary contraction (MVC) and to assess resting vaginal pressures. The authors compared two training methods, PFMT alone and combined PFMT with visceral manual therapy, and found no differences in the effectiveness of training in women with urinary incontinence [27].

In contrast, other researchers have used a digital preventive program, Prep-to-Play, to reduce head concussions and ACL injuries in female Australian rules football players. The online materials included information on game preparation, including: warm-up for neuromuscular training, game skills, recommended strength exercises, and education (rationale, benefits, technical tips, progression, well-being, and feedback). Unfortunately, the effectiveness of the Prep-to-Play program was not fully confirmed due to the timing of the study during the COVID-19 restrictions [19].

A study by Watts *et al.* [40] tested a 52-week program of digital exercise (150 minutes/week) and health education in preventing and treating Alzheimer's disease. The Prevention LEAP!Rx program, which included aerobic and resistance exercise, walking, cycling, and brain health education, showed positive effects on improving cardiorespiratory fitness ($p = 0.005$) and cognitive function. The intervention group who consistently achieved 80% of the goals had greater improvements in physical fitness than those who did not achieve the goal. The study showed that the intervention group had greater increases in mean VO_2 , a marker of body fitness, compared to the control group. It was confirmed that greater cardiorespiratory fitness in early Alzheimer's disease is associated with greater brain performance. In summary, the results of the study suggest benefits of regular physical activity, especially in the context of neurodegenerative diseases such as Alzheimer's disease. Programs such as LEAP!Rx can support physical activity and cardiovascular health in older adults, which has a positive impact on cognitive function, especially in the early stages of Alzheimer's disease [40].

Greenwood *et al.* [36] evaluated the Kidney BEAM (Kidney Behavioral Education and Activity Management) program as a treatment for patients with chronic kidney disease. The program, lasting 12 weeks, included both live and prerecorded rehabilitation sessions. It consisted of

a 10-minute warm-up, 20 to 30 minutes of aerobic and resistance training, and 15 minutes of disease education. After 12 weeks, the Kidney BEAM group showed significant improvements compared with the control group, including improved patient activation (Patient Activation Measure; PAM-13, $p < 0.0001$) and improved sit-to-stand test scores. Physical activity reduced symptoms of depression, anxiety, and fatigue. The Kidney BEAM program improved self-control, mental health, and Health-Related Quality of Life (HRQoL) in patients with chronic kidney disease, primarily due to the positive impact of physical activity [36].

Young *et al.* [35] also conducted a study using the Kidney BEAM program in patients with chronic kidney disease (CKD), taking into account psychological (emotional well-being) and physical aspects. The program included online classes, exercise videos, and educational materials delivered by nephrologists. The aim was to improve the program, increase knowledge, ensure safety, more effective forms of exercise and self-management interventions, and reach the widest possible audience. The study assessed the acceptance of the Digital Health Intervention (DHI) program by participants. Although the results indicated a positive effect on physical activity, a decrease in participation was noted over the course of the program. Nevertheless, the study provides evidence for the role of DHI in supporting self-management and physical activity among patients with CKD, with the potential to improve clinical management of this group [35].

Dieter *et al.* [32] evaluated a 12-week digital mHealth reflex program for patients with knee osteoarthritis using sensor-based orthoses. The program, which focused on muscle strengthening, mobilization, and balance training, demonstrated significant reductions in pain, improved physical function, and increased recreational and sports activity. Although overall treatment effects were moderate, digital technology showed potential for orthopedic treatment and improved physical activity. Due to the small sample size, the authors suggest further research [32].

In addition, small digital devices are commonly used among patients and athletes. Vargas-Molina *et al.* [20] used automatic digital blood pressure monitoring in women undergoing resistance training. Comparative measurements were performed after 8 weeks of training and a low- or high-calorie diet, depending on the group assigned to the study. This study highlights the growing role of digital devices in health monitoring, especially in the context of physical activity and diet. From a digital health perspective, the use of such technologies allows for precise monitoring of health variables and adjustments, e.g. training or diet, to individual patient needs. The conclusion may suggest that digital monitoring tools have the potential to support more personalized health care and improve health outcomes through continuous tracking of physiological parameters, which is crucial for the effectiveness of health interventions [20].

Luijk *et al.* [24] concluded in a 2024 meta-analysis that digital health interventions are available and can be tailored to individual patient needs, particularly for increasing physical activity. Although digital methods are effective in encouraging exercise, evidence of their broad effectiveness is limited, especially without clinical supervision. These programs may not be suitable for all patients, and their effects on health, physical activity, and quality of life are moderate. Nevertheless, the authors emphasize the need for further research on digital assistance in improving patients' physical fitness [24].

These opinions are also confirmed by our current research. Although digital interventions have significant potential, their implementation and effectiveness may depend on the personalization of programs and monitoring by specialists. In the context of physical activation, research suggests that digital tools, if well-adapted and supported by medical care, can effectively improve physical activity and health, but this requires further development and research on their optimization and side effects. There is therefore a need to adapt digital tools to individual patient needs and health aspects.

Thanks to e-databases and e-medical records, it is possible to capture diagnostic information of a wide scope, useful for adjusting the level of physical activity for a given patient [6]. Integration of digital health care with digital interventions changing behavior in physical activity is important. Due to the aging of the population, limited physical capacity, problems with maintaining optimal physical fitness, strength and muscle mass, the need for innovative and easily accessible methods of physical activation is increasing. Van den Helder *et al.* [38] confirm the positive effect of a weekly e-training program at home combined with e-coaching in order to limit the decline in physical fitness and strength, and consequently physical fitness in older people. It has been shown that in adult neurological patients (after stroke and with Parkinson's disease), sensory stimulation and treadmill training (with digital software) support maintaining a healthy body weight and have a significant effect on step length [28].

Digitalization of physiotherapy is an important aspect that promotes the growth of physical activity. Forms of digital activation should be diverse and considered in terms of age, gender, sports activity, injuries, dysfunctions and diseases of the musculoskeletal system. Any physical activity is better than none [42]. Remote motivation to increase physical activity of the population of children, adolescents, adults and the elderly is very important for improving the mental and physical health. Digitization methods are used in different age groups, both more and less physically active people, as well as different due to various ailments (Table 2). Based on this review, groups for which the use of remote/digital methods is recommended were determined and for clarity they are presented in Table 4.

Table 4. Characteristics of the groups to which digital methods are directed according to age, physical activity and diseases.

	Due to age	Due to physical activity	Due to ailments
Groups to which physical activation methods and digital physiotherapy should be particularly targeted	Children Youth Adults Senior All age groups struggling with sitting at home/lack of exercise	People leading a sedentary lifestyle and not very active Patients with reduced mobility Athletes	Obesity Patients with advanced diseases or after surgery, i.e. orthopedic, gynecological, cardiological, neurological, nephrological patients

In summary, digital activation of movement generally supports inactive people, meets the fight against obesity, can be used to improve physical fitness in orthopedic, gynecological and cardiological patients. Remote motivation to increase physical activity is important for improving mental and physical health. Additionally, digitalization has a positive impact on a separate group, which is athletes. They require highly advanced diagnostic methods to detect the smallest defects in motor coordination, muscle imbalances in the musculoskeletal system.

Conclusion

Digital health interventions increased objectively measured physical activity. Digital physical activation is a good alternative in the absence of other possibilities or low availability of stationary forms of physical activity, coexisting obstacles, i.e. physical and psycho-physical diseases, social, health, economic limitations.

Digital activation: improves physical fitness, eliminates stress, supports the formation of movement habits, is a form of relaxation or fun, is a form of encouragement and motivation, engages people, allows monitoring changes and/or progress.

It is necessary to optimize the recommendations of online exercise programs and expand existing e-training programs for different groups of exercisers.

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