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Students' Skills and Experiences Using Information and Communication Technologies in Remote Physical Education Lessons

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Abstract: Information and communication technologies (ICTs) are rapidly invading education and leading to transformation in this area. During the COVID-19 pandemic, the traditional educational process was moved to a remote environment, and educators faced many challenges in maintaining the same quality as face-to-face teaching. Physical education (PE) lessons should be marked out as a special case. The aim of this research was to determine the relationship of 8–12th-grade Lithuanian students to information and communication technologies and to reveal students' experiences of participating in remote PE lessons. A total of 268 students selected by the convenience sampling method filled out a questionnaire consisting of four blocks with 53 closed and 4 open questions divided into topics. The relationships between physical activity during quarantine and its predictors were assessed using linear and hierarchical regression analyses. It was estimated that students' computer literacy skills were slightly higher than average, and positive attitudes of students towards ICT in the educational process would prevail. In remote PE lessons, students usually exercised independently or together using a video communication program. Students' expectations for remote PE lessons included the performance of sports, interesting and active challenges, and the opportunity to be independent. Older students and students who spent more time with ICT and had lower computer literacy skills were less physically active and fit. During the quarantine, students' physical activity and fitness decreased.

Keywords: information and communication technologies; physical education; online learning; remote physical education classes

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1. Introduction

The contemporary world is inseparable from information and communication technologies (ICT). The latter are rapidly invading various areas of human life: everyday routines, business, and even education. ICT in education opens new educational opportunities, integrating diverse topics and abundant and up-to-date information resources, as well as providing a lot of space to express creativity, utilize existing skills, and develop critical thinking [1,2]. At the same time, the educational process itself is changing [2]. ICT creates opportunities for changes in teaching and learning methods and teaching content and is a primary driving force behind education reforms. The introduction of new technology-assisted learning tools, such as mobile devices, smartboards, MOOCs, tablets, laptops, simulations, dynamic visualization, apps, and virtual laboratories, has altered education in schools and institutions. ICT applications in education started with the use of the desktop PC in 1996~, followed by e-learning in 2003~ using the Internet PC, afterwar m-learning in 2005~ using the Notebook and PDA (Personal Digital Assistant), with later upcoming u-learning in 2010 using smartphones. The year 2012 was the start of the era of Smart Education, with the use of several devices in education [3]. Smart Education always involves the application of ICT in a way that makes learning more interesting and easier, and it is a

method that allows teachers to develop their students' competencies that are indispensable for effective functioning in the reality of the 21st century [4,5]. Smart Education is based on the five elements arising from the SMART acronym: (1) self-directed, (2) motivated, (3) adapted, (4) resource-enriched, and (5) technology-embedded [6]. Despite the new opportunities opened by information and communication technologies in education, the integration of ICT into the existing education system is a slow and complex process that requires a complex approach [7], especially in Physical Education. At the start of digital era, ICT was mostly used only for video analysis, and PE digital technology has mostly been connected to topics such as lack of exercise [8], but the COVID-19 period forced educators to shift the entire education process online and to additionally use all the existing ICT resources and, even more, to open up completely new possibilities that are the result of new technologies, such as virtual or augmented reality [8].

In the scientific literature, several main obstacles to the successful integration of ICT into the education system have been distinguished: a lack of ICT resources in schools, a lack of teachers' confidence in their ICT abilities, a lack of competence in using ICT, and a negative attitude towards ICT [9,10]. In order to ensure the smooth integration of information and communication technologies into the educational process, it is important to act systematically and to take into account all technological-, teacher-, and institutional-level factors and barriers [11]. This means that it is necessary to invest in ICT equipment at the national level, to update educational content, to prepare computer-based methodological materials, and to invest in teachers' abilities and knowledge in this area [12,13]. It is worth noting separately that when creating effective educational models of ICT development, it is important to consider not only technological, teacher, and institutional factors, but also student-level factors and barriers. The presented Lawrence and Tar model does not include student-level factors, so it should be supplemented by including the latter. In a review article, Jo Shan Fu [14] notes that student motivation, ICT acceptance, ease of use, and usefulness are the main factors that influence the use of ICT among students. Many didactic processes that have been described and implemented in experiments with the use of technological devices did not clearly provide for teachers, explaining how to use such devices with the optimal training necessary to carry out the process [15,16]. Therefore, only insignificant modifications in the way of teaching and learning have occurred, since in many cases, both teachers and students are accustomed to traditional methods of teaching [17,18]. Unfortunately, this topic has not been studied much in the scientific literature and requires additional attention from researchers [19].

The integration of information and communication technologies into physical education lessons, and especially conducting physical education lessons in a virtual space, has been poorly researched in the global scientific community [20,21]. Most of the research on this topic is related to the use of ICT in the process of physical education at school. Pedometers or coordination-testing machines [22], active video games [23], and phone apps for analyzing and illustrating sports activities [24,25] or dance movements [26] have been used in physical education lessons. The use of ICT in physical education lessons poses challenges—students may feel uncomfortable being filmed, especially those who do not have a positive attitude towards their body image, and issues of ensuring the protection of individuals' data also arise [27].

With the start of the COVID-19 pandemic, ordinary everyday life and education changed significantly. Closed sports spaces, remote classes, and restrictions on movement from home have undoubtedly changed people's physical activity habits as well their education processes. Many researchers have reported decreased physical activity in adults [28], adolescents, and children [29] and increased sedentary time, especially time spent with information and communicative technological devices [30]. The advanced integration of ICT into the educational process made it possible to transfer the traditional educational process to a remote space in many countries during the 2020 COVID-19 pandemic. Nevertheless, the whole world has faced challenges in how to maintain the same quality of teaching in a remote space and how to achieve the educational goals intended for face-to-face classes.

Physical education lessons should be singled out, as their nature is inseparable from movement and physical activity, and the adaptation of content and educational methods to online lessons has been poorly researched [20,31].

Before the COVID-19 pandemic, most of the research on this topic was related to the use of ICT in the process of physical education at school [22,23,26]. Even with the transfer of PE lessons to the online space during the pandemic, only a few publications have included teachers' well-being [32], a review of distance physical education infrastructure resources [33], and students' attitudes towards distance physical education lessons [34]. According to researchers, with the proper implementation of remote physical education lessons, it is hypothetically possible to achieve the goals of a traditional lesson, but this requires considerable resources and strong preparation, as well as more detailed scientific research [35]. Undoubtedly, it is important to learn more about the challenges faced in remote PE lessons and the qualities that would allow for ensuring a quality remote PE process in the future. Therefore, the aim of this study was to determine the relationship of Lithuanian students in grades 8–12 to information and communication technologies and to reveal the experiences of students participating in remote PE lessons.

The following hypotheses were raised to achieve the aim of the study:

1. The computer literacy skills of 8–12th grade students in Lithuania are at a high level, and positive attitudes prevail among students with regard to ICT in the educational process.
2. Students' activities, tasks, and evaluation methods in remote PE lessons will be different.
3. Students want to play sports and engage in interesting physical activities during remote physical education lessons.
4. Students with higher computer literacy skills and better academic performance will be less physically active and physically fit.
5. During the quarantine, students' physical activity and fitness will decrease.

2. Materials and Methods

2.1. Research Process and Participants

The study was conducted in February–March 2021. Research participants selected by convenience sampling had to complete a 5–7 min online questionnaire. Respondents were recruited using different methods: sending e-mails or letters directly to physical education teachers, contacting school administration, and publishing information about the study on social networks. Thus, 36 school administrations and 20 physical education teachers were contacted directly. The researchers obtained permission from the school administration to collect data. Links to the online questionnaires for students and informed consent for parents were provided by the researchers and sent by the school administration. Informed consent was collected from parents online. Students whose parents did not give consent or who refused to participate did not participate in the study. All research participants, physical education teachers, and school administrators were familiarized with the research aim, procedures, and data protection process. If need be, it was possible to contact the researchers by phone or e-mail. Completing the questionnaire took about 10–15 min. A total of 268 respondents, 69 boys (25.7%) and 199 girls (74.3%) aged 15–18 years completed the questionnaire. The reliability and validity of this questionnaire were tested via online contact with a group of 30 (15- to 16-year-old) students and have been reported as $r = 0.72$ ($p < 0.05$).

In this research context, national and international research ethics guidelines were followed [36]. Each participant was asked to complete the questionnaires after receiving an informed consent form. In order to ensure the confidentiality and the anonymity of research participants, the questionnaire did not include collecting the personal data of the respondents, which would allow researchers to identify them. The study followed the principles of the Helsinki Declaration and national guidelines concerning the ethical guidelines and legal requirements. The study was approved by the principals of the schools, each student participated voluntarily, and informed consent was obtained from parents

in advance. The permission of the Lithuanian Sports University Social Research Ethics Committee (Nr. SMTEK-19; 21/02/2021) was obtained to conduct the research.

2.2. Questionnaire Survey

The questionnaire for the survey given to the students consisted of two parts—closed and open questions, which allowed us to look at the research phenomenon from both a quantitative and a qualitative perspective. The questionnaire consisted of 4 blocks containing 53 closed and 4 open questions, which were divided into topics.

The first block of the questionnaire consisted of questions to determine general data such as age, class, height, weight, place of residence and living conditions, and educational achievements. Students were divided into groups according to their learning achievements: 10–9 points—excellent and very good learners; 8.9–8.0—good learners; 7.9–7.0—average learners; 6.9 points and below—poor learners.

The second block included questions based on the freely accessible questionnaire "School overview: ICT in education" [37,38], prepared by the European Commission's Directorate-General for Communication Networks, Content and Technologies, to investigate the impact of ICT on students' learning, as well as their attitudes towards ICT and computer literacy skills. The first subscale of the questionnaire consisted of 7 statements allowing us to assess the impact of ICT on student learning. An example of such a statement is: "Using ICT makes me pay more attention to what I am learning" (Cronbach's Alpha coefficient for this scale was 0.828). The second subscale of the questionnaire consisted of 4 statements allowing us to assess students' attitudes towards ICT, and an example of such a statement is: "Using ICT in learning is fun" (Cronbach's Alpha coefficient for this scale was 0.624). The statements of the third scale covered the theme of students' computer literacy skills (Cronbach's Alpha coefficient for this scale was 0.837), for example, how students could use different devices or install some programs. The students had to evaluate each of the statements presented in the first and second subscales on a 5-point scale (Likert scale), where 1—completely disagree, 3—neither agree nor disagree, and 5—completely agree, and 2, 4—intermediate rating options. The third subscale of the questionnaire consisted of 11 statements, which allowed us to evaluate the subjective qualities of students' computer literacy. An example of such a statement is: "Hardware installation". Students had to evaluate each statement of the third scale on a 5-point scale (Likert scale) according to how well they were able to perform the action indicated in the statement, where 1 is very poor, 3 is average, 5 is very good, and 2, 4 are intermediate evaluation options. Cronbach's Alpha coefficient of the second block questionnaire scale was 0.838 (that of the first subscale—0.828, the second subscale—0.264, and the third subscale—0.837).

The third block contained specific questions related to the conduct of physical education classes during the COVID-19 pandemic. In closed questions, students had to choose the option/options that reflected their experiences or opinions or to write their own option if there was no suitable option among the possible answers. In closed questions, respondents could choose several answer options, so the graphs and text show the results by the number of research participants' answers. For example, in the question "What ICT tools did physical education teachers use when conducting lessons remotely during the quarantine period?", students could mark several choices from the ones pro-vided ("Youtube", "MsTeams", "Tamo.lt", "Zoom", or "Enter your answer") if their teachers used multiple video chat applications or websites to conduct lessons. In the part with open-ended questions, students' answers were categorized according to topics (selecting the words or thoughts of the respondents that connected or separated the experiences and practices of the participating respondents), and respondents had the opportunity to express their opinions and feelings and to share their experiences. The results of this section are presented in terms of the number of mentions of repeated words/phrases.

In the fourth block, respondents were asked about their physical activity and fitness typically and during quarantine and their time spent on smart devices for educational and leisure purposes. According to the WHO recommendations for physical activity [39],

students were divided into physically inactive and active by determined PA frequency, times/week (with options: every day, 4–6 times a week, 2–3 times a week, once a week, once a month, less than once a month, never) and duration, (with options: 7< h/week, 4–6 h/week, 2–3 h/week, 1 h/week, 0.5 h/week, and 0 h/week). Further, students subjectively assessed their PA and PF (physical fitness) in their free time on a ten-point scale.

2.3. Mathematical Statistics

The "IBM SPSS Statistics 26" program was used to perform the statistical procedures of the study. Descriptive statistics methods were used for data presentation: arithmetic mean ($\overline{x}$), standard deviation (SD), and percentage frequencies of responses were determined. Pearson's correlation coefficient was used to assess the relationships between students' age, computer literacy, learning achievements, ICT use, and PA and PF. Wilcoxon's test was applied to compare physical activity typically and during quarantine. Correlations between physical activity during quarantine and its predictors were assessed using linear and hierarchical regression analyses. χ^2 (chi-square) criterion was used to evaluate the differences in the answers to the questions of the questionnaire in terms of gender, classes, physical activity, and averages of educational achievements.

3. Results

3.1. Effect of ICT on Student Learning

The results of the survey showed that the majority of respondents felt more independent when learning using ICT, and they also tried harder to learn that which they were learning (Figure 1).

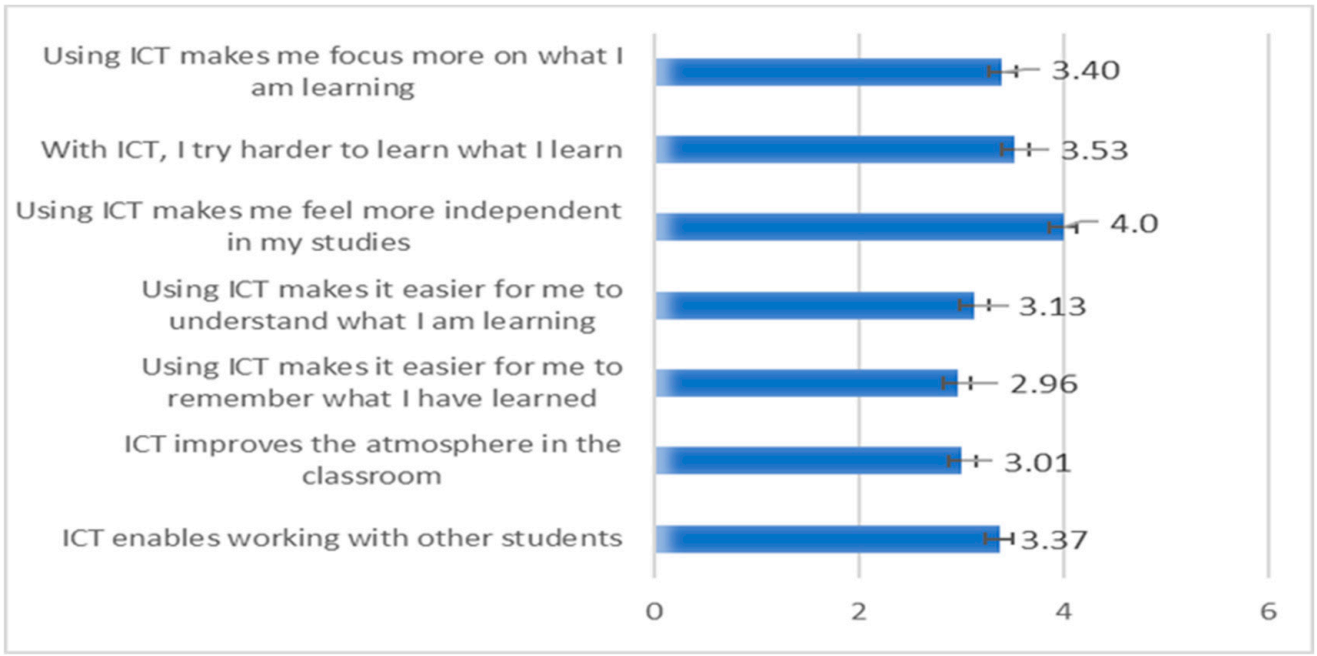

Figure 1. The averages of students' responses to the statements of the questionnaire subscale "The impact of ICT on student learning".

3.2. Students' Attitudes towards ICT

More than half of the surveyed students indicated that they agreed or strongly agreed that using ICT in the learning process was fun, and that when using ICT, they learned new things that would help them in the future (Figure 2). In the analysis of students' attitudes towards ICT in terms of student learning achievements, a statistically significant difference was determined: students with better academic performance were more likely to procrastinate if they had to use ICT to complete the task than students having average

or poor academic results (χ^2 = 21.834; df = 6; $p < 0.05$). Moreover, students' attitudes towards ICT in terms of physical activity showed a statistically significant difference—more physically active students lost track of time more often when using ICT in the learning process than more physically inactive students (χ^2 = 10.294; df = 4; $p < 0.05$).

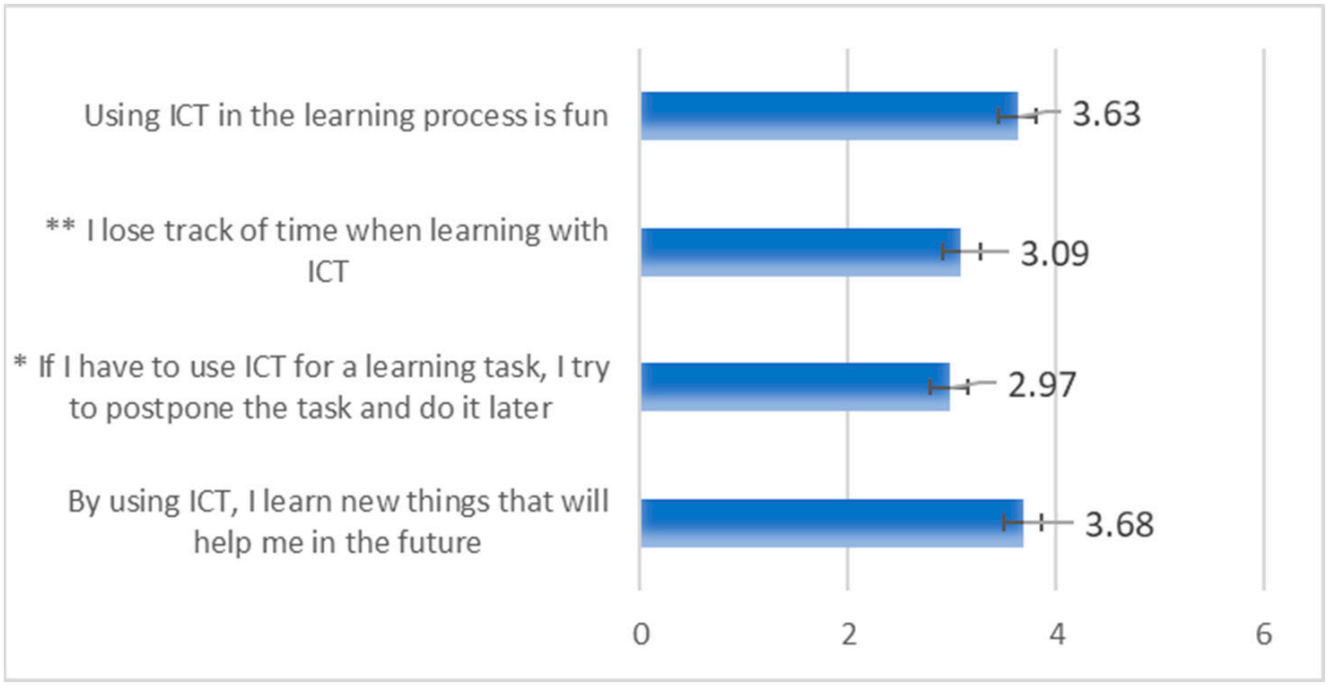

Figure 2. Means of students' responses to the statements of the subscale "Students' attitudes towards ICT". Notes: * statistically significant differences were determined in terms of learning achievement group ($p < 0.05$). ** Statistically significant differences were determined in terms of PA group (as usual) ($p < 0.05$).

3.3. Students' Computer Literacy Skills

Students' computer literacy skills were slightly above average (overall average score—3.86). Most of the respondents indicated that they were very good or good at using the Internet, e-mail, social networks, and chat programs. The respondents lacked the ability to create a web page and edit audio recordings (Figure 3). Analyzing students' computer literacy skills, statistically significant differences were found in three subscale statements in terms of students' gender. Boys had better hardware (χ^2 = 19.494; df = 2; $p < 0.05$) and software (χ^2 = 15.059; df = 2; $p < 0.05$) installation skills, but girls were better at using social networks than boys (χ^2 = 11.860; df = 2; $p < 0.05$). In addition, students' computer literacy skills in terms of students' learning achievements showed a statistically significant difference: higher-achieving students were better able to use educational software than poorer students (χ^2 = 23.759; df = 6; $p < 0.05$).

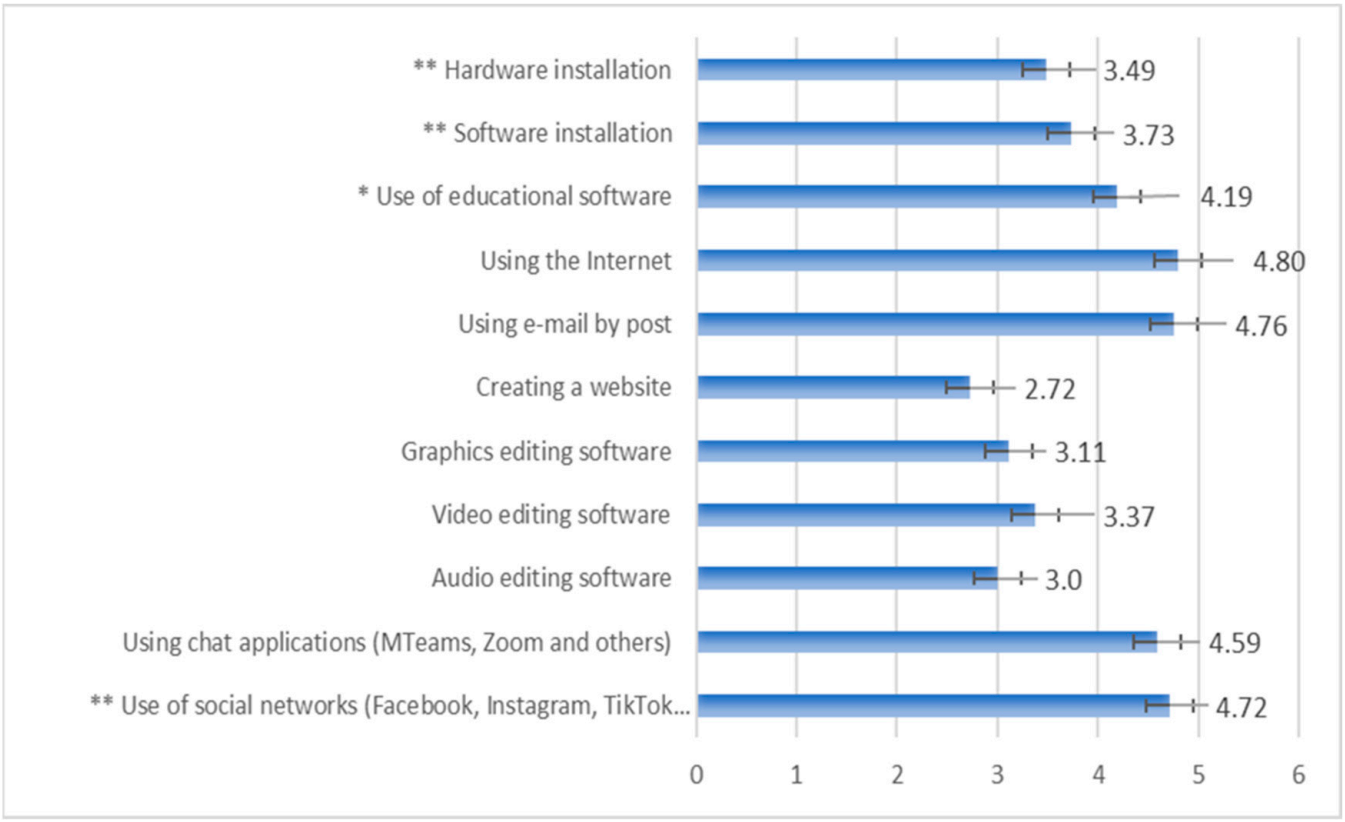

Figure 3. Averages of students' responses to the statements of the questionnaire subscale "Students' computer literacy skills". Notes: * statistically significant differences determined in terms of learning achievement group ($p < 0.05$). ** Statistically significant differences determined in terms of gender ($p < 0.05$).

3.4. Relationships between Students' Computer Literacy, Learning Achievements, ICT Use, PA, and PF

After performing a correlation analysis of individual variables (age, computer literacy, educational achievements, time spent on ICT, physical activity, and physical fitness outside of quarantine and during quarantine), ten significant relationships were identified. All significant correlations found were weak. Older students were less physically active outside of quarantine (as usual) ($r = -0.128$; $p < 0.05$) and during quarantine ($r = -0.128$; $p < 0.05$) and were less physically fit during quarantine ($r = -0.127$; $p < 0.05$) than younger students. Students who spent more time on ICT equipment in their free time were less physically active both outside of quarantine ($r = -0.250$; $p < 0.01$) and during quarantine ($r = -0.198$), as well as less physically fit both outside of quarantine ($r = -0.198$; $p < 0.01$) and during quarantine ($r = -0.184$; $p < 0.01$). However, students with higher computer literacy skills were more physically active during quarantine ($r = 0.143$; $p < 0.05$), and they also demonstrated higher physical fitness levels both outside of quarantine ($r = 0.186$; $p < 0.01$) and during quarantine ($r = 0.183$; $p < 0.01$). The impact of quarantine on students' physical fitness and activity and time spent on ICT was analyzed. The Wilcoxon criterion for the means of two repeated measurements was chosen to compare the students' subjectively assessed physical activity and fitness before and after the quarantine (Figure 4). Students exercised and played sports less frequently in their leisure time during quarantine ($Z = -5.493$; $p < 0.001$) and spent less time on it. Further, students' physical activity ($Z = -10.382$; $p < 0.001$) and fitness decreased during quarantine ($Z = -9.618$; $p < 0.001$) (Figure 4). More than half of the respondents (58.3%) indicated that they spent an average of seven or more hours daily at a computer and/or smart device (tablet, mobile phone, etc.) for learning purposes, and 50%

of students noted that they spend an average of 3–6 h on a computer and/or smart device for non-learning purposes.

In the analysis of the significance of socio-demographic and individual factors, it was found that physical activity during quarantine was significantly predicted by the independent variables in the regression model (regression model R2 = 0.610, adjusted R2 = 0.603, F statistic change $p = 0.000$). Female gender (β = 0.089), better assessment of the quality of remote learning (β = 0.117), and better physical capacity during quarantine (β = 0.708), as well as regular physical activity (β = 0.284), were associated with higher physical activity during quarantine, but better usual physical fitness (β = −0.213) was associated with poorer physical activity during quarantine (Table 1). Hierarchical regression analysis showed that gender explains 1.3%, evaluation of the quality of remote classes—6.4%, physical fitness during quarantine—50.2%, physical activity as usual—1.5%, and usual physical fitness—1.6% of changes in physical activity during quarantine.

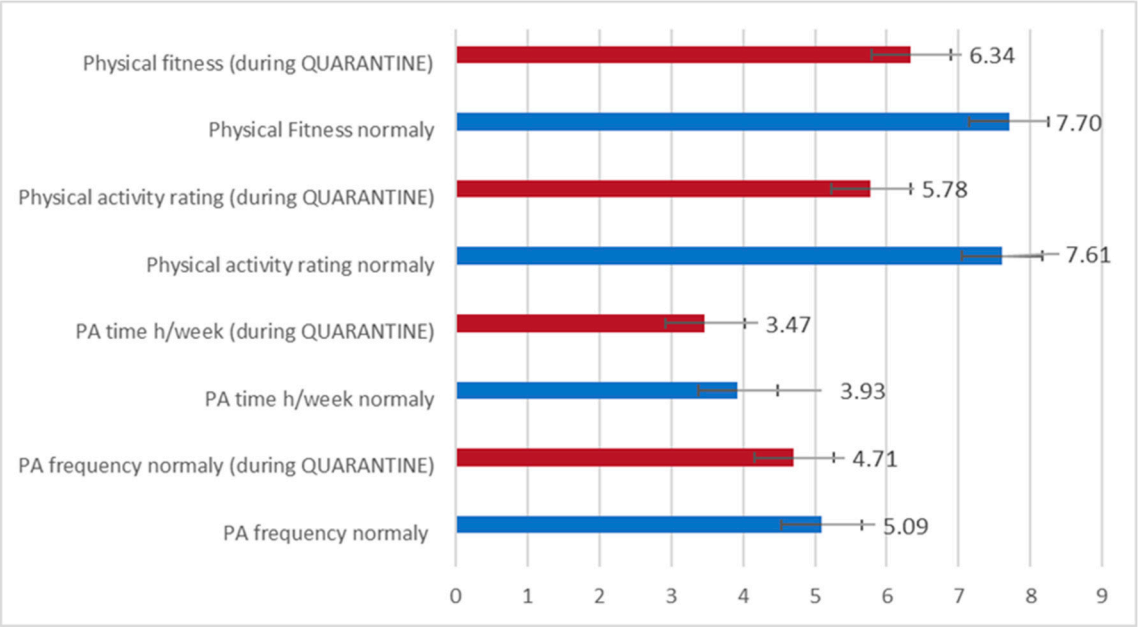

Figure 4. Comparison of means (scores) of students' subjectively assessed PA and PF in their leisure time and the frequency of physical activity normally and during quarantine.

Table 1. The significance of sociodemographic and individual factors for physical activity during quarantine.

Dependent Variable: Subjectively Assessed PA (during Quarantine)	B	β	R2 Change	Student's t	*p*
Gender	0.480	0.089	0.013	2.280	**0.023**
How do you rate the quality of remote physical education lessons?	0.121	0.117	0.064	2.946	**0.004**
Subjectively assessed PF (during quarantine)	0.777	0.708	0.502	15.721	**0.000**
Subjectively assessed PA (as usual)	0.351	0.284	0.015	4.623	**0.000**
Subjective PF (as usual)	−0.275	−0.213	0.016	−3.320	**0.001**
Constant		−1.369		−2.345	0.020

3.5. Experiences and Expectations of Remote PE Classes

In the closed questions of this section, respondents could choose several answer options, so the results are presented in the text as the number of research participants' answers. According to the respondents, during the COVID-19 pandemic, physical education lessons

were mostly carried out by independently performing practical movement tasks presented by the teacher, as well as by performing practical movement tasks remotely together with their classmates. A small number of respondents indicated that physical education lessons included only the examination of theoretical materials or were not conducted at all. Physical education teachers of the surveyed students were mostly in the age groups of 40–50 and 30–40 years. During the COVID-19 pandemic, teachers mostly used YouTube (155 responses), MsTeams (130 responses), Tamo.lt (55 responses), and Zoom (52 responses) websites and chat programs to conduct physical education lessons.

Teachers ensured student attendance and involvement in the PE lesson process by marking attendance (158 responses), mandatory participation in the lesson with the camera turned on (146 responses), sending completed tasks in text format (115 responses), sending completed tasks in photo format (92 responses), and sending completed tasks in video format (67 answers). Only 20.1 percent of respondents indicated that their physical education teachers used ICT in physical education lessons before the COVID-19 virus pandemic. Pedometers (42 responses) and sports/exercise apps (21 responses) and videos (20 responses) were most often used in physical education lessons. Even 60.8 percent of surveyed students believed that the COVID-19 virus pandemic strongly or very strongly encouraged the integration of ICT in PE lessons.

During remote physical education lessons, respondents mostly exercised independently using video materials on the YouTube platform (167 responses) or exercised together through a chat program with the camera turned on (155 responses), counted the steps taken (136 responses), filled in physical activity diaries (86 responses), played sports outdoors (75 answers), and familiarized themselves with the theoretical materials of different sports (73 answers).

The surveyed students indicated that they most enjoyed the tasks related to sports (37 mentions) and exercise (6 mentions), step counting (26 mentions), walking (10 mentions), as well as active outdoor activities (17 mentions), including the environment, for example, experiencing the snow in the winter (4 mentions). Students also engaged in sports with a video camera (26 mentions) and based on video materials on the YouTube platform (15 mentions). Students liked the fact that the tasks could be done independently (20 mentions). At the same time, respondents indicated that they would most like independent/individual physical activity tasks (31 mentions), sports and exercise (30 and 14 mentions), and yoga and flexibility training tasks (10 mentions). Students would enjoy walking (7 mentions) and step-counting tasks (13 mentions), and they would like to be active outdoors (14 mentions). According to the respondents, they would like interesting (6 mentions), active and vigorous (9 mentions), and challenging (13 mentions) remote physical education lessons. Unfortunately, some respondents indicated that they would prefer not to do anything during remote PE lessons (23 mentions). Even 67.5 percent of students rated the quality of remote physical education lessons as seven or higher in a ten-point system.

In our study as well, students were asked to describe in three words what respondents liked most about using ICT in physical education lessons. The most frequent answers were "*independence*" (30 mentions), "*engagement in sports*" (20 mentions), "*fun, amusement, interest*" (16 mentions), and "*simplicity and convenience*" (14 mentions). Further, the respondents had to name in three words what difficulties or obstacles they faced when using ICT in physical education lessons. The most popular answers were "*I don't encounter any*" (50 mentions), "*Internet connection disturbances, crashes*" (53 mentions), and "*It's hard to force myself, I lack motivation*" (45 mentions).

4. Discussion

The main aim of our research was to determine the relationship of 15–18-year-old students to ICT and to reveal students' experiences of participating in remote PE lessons. Our hypotheses that the computer literacy skills of students in grades 8–12 are at a high level, and that students have positive attitudes towards information and communication

technologies in the educational process, were partially confirmed. The results of the study showed that the overall computer literacy skills of the interviewed students were slightly higher than the average level, but at the same time, a clear trend can be seen that students were perfectly able to perform basic actions using ICT devices, but they lacked the ability to perform more complex tasks. A study conducted in Finland [40] indicated that digital skills consisting of basic activity, content creation, and information retrieval skills are at a high level among students, but advanced technical skills such as software and operating system installation, initiation, maintenance, and updating, as well as information networks and security issues, pose far more serious challenges for students. Similar observations were found among students in Italy [41], Chile [42], and even during the COVID-19 period in Turkey [43]. These observations are also related to the results of research by other authors suggesting that the use of ICT in the educational process promotes positive attitudes among students [44,45].

We also hypothesized that students' experiences of remote PE lessons would differ. According to the responses, we can see that the programs chosen by the teachers to con-duct the lessons, the tasks given to the students during the lessons, and the means of ensuring student attendance and involvement in PE lessons differed, but all of these processes can be grouped, and the most frequently used can be singled out. Remote physical education classes usually took place, during which students usually exercised independently based on material on the YouTube platform or together using a video chat program, and participation in the class was ensured by marking attendance. Tardif Grenier et al. [46] found in 2021 that 26.5% of students used online or digital platforms for PA. Mercier et al. [47] concluded that remote PE classes were different among students living in different areas (rural or urban) and in terms of gender and ethnic groups. Mujiono and Gazali's [48] literature review "Physical Education during the COVID-19 Pandemic" indicated that various tools have been used to implement physical education, many of which are similar to those mentioned in our study, such as video chat programs and software packages offered by Google, but at the same time, this literature review distinguished such tools that could be used if students do not have computers, for example, printed teaching materials or a short message from the teacher. However, no one indicated these tools in our study, possibly because the survey was conducted online, so people without ICT tools could not fill out the survey questionnaire. At the same time, it should be noted that during the second quarantine in Lithuania (autumn 2020), the vast majority of students (79%) claimed to have their own ICT equipment that was necessary for participating in the learning process, and 16% of them shared the necessary equipment with family members. Less than 3% of respondents borrowed ICT equipment from the school, and only 1% of students stated that they did not have the necessary equipment for distance learning and were not ready for it [49].

This study showed that it is important for students to be independent, to have more opportunities to make decisions on their own, as well as to play sports and to overcome interesting challenges. These findings are in line with research emphasizing that effective PE programs must include that which is currently relevant in today's society, be composed of vigorous activities of moderate and high physical intensity, and focus on the physical fitness of students. Research findings emphasize that it is important for students to be able to join PA events at their own ability level and to progress and at their own pace, as well as to be able to set and control their own goals [50,51].

Our study hypothesized that students with higher computer literacy skills and better academic performance were less physically active and physically fit, but neither hypothesis was confirmed. In hypothesizing that better-achieving students would be less physically active, we relied on the theory that as schools focus more on academic achievement, less attention is paid to physical activity [52]. We also assumed that higher computer skills would be associated with longer time spent on ICT, and therefore with lower physical activity and fitness of students. No significant associations were found between academic achievement and physical activity and fitness. The opposite relationship was found: students with higher computer literacy skills were more physically active and fit. However,

time spent on ICT during leisure time was associated with lower physical activity and fitness. The results of our study revealed a tendency for older students to be less physically active. The results of other research also have shown age-dependent physical activity and indicated a decrease in PA in students during adolescence [53–55] and especially during the pandemic period [49,56–58]. A study conducted by Troiano's [59] team indicated that 42% of children aged 6–11 years in America met the recommended 60 min per day PA norm, whereas only 8% of adolescents reached this norm, and similar data were found in Australia [60]. Much research has estimated that students' decline in physical activity during the pandemic period was negatively associated with a lack of psychological well-being, depression, and sadness [49,61,62], which can indirectly lead to reduced academic performance [63,64].

The hypothesis raised before the start of our research, that the physical activity and fitness of students significantly decreased during the quarantine, was confirmed, and it was dependent on physical activity before pandemic. In the latest scientific literature, the data on this topic are contradictory: some studies show an increase in physical activity of individuals during the pandemic [65]; however, most scientists state that the quarantine has had a negative effect on physical activity, especially among young people [49,56–58,60,66]. A Canadian study [67] in which 1472 parents of children and youth aged 5–17 completed a survey showed that only 4.8 percent (2.8 percent of girls, 6.5 percent of boys) of children (5–11 years old) and 0.6 percent (0.8 percent of girls, 0.5 percent of boys) of young people (12–17 years old) reached the WHO movement guidelines during the pandemic period [67]. In a French study involving 6491 children (aged 6–10) and adolescents (aged 11–17), 42.0% of children and 58.7% of adolescents reported reduced physical activity during quarantine [68]. According to scientific literature sources, the closing of schools and the transfer of the educational process to the online space during the quarantine can be considered the main factor in the decrease in physical activity of young people, because schools and especially physical education classes provide the right environment to encourage active behavior in children and adolescents [69,70], and there is no sufficient evidence that this loss of physical activity can be compensated by activities at home [71–73]. Further, after transferring the process of physical education to the online space, PA related to the mobility of students decreased [56,69,71].

The weakness of this study is that the sample of research participants (268 respondents) is not representative, as it is too small compared to the entire population of students in grades 8–12 in Lithuania. Due to the small sample and the convenient sampling method chosen, the results of this study cannot be generalized to the population of Lithuanian students in grades 8–12. The research process was complicated by the second wave of the COVID-19 virus pandemic, which prevented the questionnaire from being distributed live to students in schools, and participation was low when completing the questionnaire online. Potential respondents were contacted using information and communication technologies, which seems to automatically eliminate the possibility of participating in the study for those students who do not use them.

Despite its shortcomings, this is the first study of this kind in Lithuania including students in grades 8–12, which allowed not only for an assessment of students' basic computer literacy skills and attitudes towards ICT in the educational process, as well as their experiences and expectations of online physical education classes, but also for determining the links between students' age, computer literacy skills, learning achievements, time spent on ICT, and subjectively assessed physical activity and physical fitness, and to assess the impact of the quarantine on students' physical fitness and activity.

Computer literacy skills of Lithuanian students are at a high level, and students have positive attitudes towards information and communication technologies in the educational process. It is important to note that the issue of ICT integration into the education process is especially relevant in these times, when the whole world is facing the COVID-19 pandemic and the war in Ukraine, and most of the education process has been transferred to an online environment. Moreover, physical education, physical activity programs, and public health

policy should focus on evolving and ongoing PA promotion among youth, particularly to address existing disparities (e.g., age, gender, and socio-economic). In addition, it is necessary to reveal the effect of ICT integration on distance learning and on the educational process with different interventions in terms of educators' ongoing, updated ICT skills.

5. Conclusions

Computer literacy skills of 8–12th grade students in Lithuania are slightly higher than the average level, and their positive attitude towards ICT in the educational process prevails. Students' experiences of remote physical education lessons varied: during re-mote PE lessons, they usually practiced sports on their own based on materials on the YouTube platform or together with a teacher using a video chat program. Participation in the lesson was ensured by marking attendance. Students' expectations for remote PE lessons included sports, interesting and active challenges, and the opportunity to be independent. Students who were older, spent more time on ICT in their leisure time, and had lower computer literacy skills were less physically active and able. During the quarantine, students' physical activity and fitness decreased.

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