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To cite this article:

Fred, N., Mikkonen, K., Pramila-Savukoski, S., Hylkilä, K., & Kuivila, H. (2023). Upper secondary school students' experiences of how exercise breaks affect their well-being and ability to study: A qualitative study. *International Journal of Research in Education and Science (IJRES)*, *9*(3), 715-731. https://doi.org/10.46328/ijres.3210

IJRES International Journal of Research in Education and Science
2023, Vol. 9, No. 3, 715-731 https://doi.org/10.46328/ijres.3210

Upper Secondary School Students' Experiences of How Exercise Breaks Affect their Well-being and Ability to Study: A Qualitative Study

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Article Info

Article History

Received:
10 March 2023
Accepted:
29 June 2023

Keywords

Upper secondary school
Student
Break exercise
Ability to study
Well-being
School exhaustion

Abstract

School exhaustion among upper secondary school students has increased at an alarming rate in recent years. There is evidence that this exhaustion affects students' ability to study, and that students experience their studies as burdensome. Distance learning has further weakened students' ability to study. This study aimed to describe upper secondary students' experiences of how exercise breaks affect their studying and well-being. The data were collected through thematic interviews with 15 first-year upper secondary students in the spring of 2021. The data were analyzed by inductive content analysis. The results indicate that exercise breaks positively influenced students' subjective experiences of their studying ability and well-being. This insight could be relevant to planning secondary education, teacher training, and school health care, along with the development of services to support well-being among upper secondary students.

Introduction

We live in a performance-oriented society where the focus on competition is no longer limited to adults, but has recently also shifted to young people (Zeedyk et al., 2003; Salmela-Aro, 2010; Klinger et al. 2015; Evans et al. 2018). Education and academic performance are substantial sources of stress for adolescents. It is common for students to report high levels of stress related to academic performance. This stress affects both physical and mental health, and is a cause of various academic problems. Thus, adolescents should be afforded possibilities to develop their coping abilities during this vital development period. Beneficial stress-management skills may invariably help adolescents throughout their lives because many longstanding health-related behaviors – positive and negative – can be traced to adolescence and early adulthood (Pascoe et al. 2020). For example, Finland has, for the first time in history, a generation of children who are more stressed than their parents (Ministry of Education and Culture, 2017). Although Finnish adolescents have performed well in international comparisons of learning outcomes and educational achievements, student satisfaction with school remains among the lowest in Europe (Salmela-Aro & Näätänen, 2005; Salmela-Aro, 2013).

Over the past five years, school exhaustion cases have increased among Finnish upper secondary students (Salmi-Aro & Hietajärvi, 2019), with over 15% of first- and second-year upper secondary students experiencing school exhaustion (THL, 2019). Moreover, one in five students feels that they need study support, while 40% feel that

studies in upper secondary school are mentally burdensome (Salmela-Aro & Hietajärvi, 2019). Another study found that 75% of students' emotions are negative and related to stress, fatigue, and anxiety (Ministry of Education and Culture, 2017). School exhaustion seems to increase during the transition to upper secondary school (Salmela-Aro 2010; Klinger et al. 2015). For example, the importance of matriculation examinations increased in the 2020 reforms to the admission process at Finnish universities, and some researchers have suggested that this change has increased stress among Finnish upper secondary school students (Vallinkoski, 2020). An international survey of 540 000 students between 15-16 years of age from 72 countries found that 66% reported stress related to poor grades, 59% reported that they worry about the difficulty of tests, 55% reported feeling very anxious about school tests, and 37% reported feeling stressed and anxious while studying. In the same study, girls reported higher levels of anxiety about school assignments than boys (OECD, 2017). School exhaustion and emotional fatigue manifest as a fear of failure, lack of self-esteem, perceived workload, and stress-increasing strain. Sleep deprivation, depression, and muscle aches in the neck and shoulders are also common symptoms (Salmela-Aro & Näätänen, 2005; Randall et al. 2019).

Musculoskeletal problems among students have become more prevalent due to decreased physical activity and increased sedentary behavior (Fares et al., 2017; David et al., 2021). Notably, about 10% of upper secondary students in grades 1-2 reported suffering from neck and shoulder pain on a daily basis, while about 30% suffered from this type of pain every week. Moreover, 7% and 20% of students suffer from headaches on a daily and weekly basis, respectively, while about 19% of students reported having lower back pains on a weekly basis (THL, 2019).

Adolescents' neck and shoulder pain has been linked to excessive computer and digital device use, while musculoskeletal pain among adolescents has been associated with heightened levels of stress and anxiety (Auvinen et al., 2016, Eriksen et al., 2017; David et al., 2021). Increased screen time, lack of physical activity, and unfavourable workplace ergonomics – all of which have become commonplace in contemporary society – have been presented as risk factors for neck and shoulder symptoms (TEKO, 2021a; Fares et al., 2017; David et al., 2021). The psychosomatic symptoms of these lifestyle characteristics include headaches, abdominal pain, along with low-grade pain or aches in the neck, shoulders, and/or lower back (Vikat et al., 2000; Ståhl, 2014; Eriksen et al. 2017; Fares et al., 2017; David et al. 2021).

During the spring of 2020, the Covid-19 pandemic spread across the world. By March 12th, 2020, 46 countries across five continents had declared school closures in an attempt to restrain the spread of the new coronavirus, Covid-19 (Huang et al. 2020). The current pandemic has increased mental strain, loneliness, and screen time among adolescents, and has also been associated with a lack of motivation due to workload and concentrations problems (The Union of Upper Secondary School Students, 2020; Octavius et al., 2020; Xiang et al., 2020; Niemi & Kousa, 2020). As such, the Covid-19 pandemic has negatively affected adolescents' mental health. For instance, many countries have reported that mental health problems among adolescents have more than doubled in 2020-21. The school closures caused by the Covid-19 pandemic have affected students in many ways, with available data showing a surge in mental health problems among 15-24-year-olds (OECD, 2021).

The physical and mental symptoms caused by excessive screen time, sedentary behavior, and mental strain negatively affect studying ability and learning (Carson et al., 2016; van Delden et al. 2020). However, stress management techniques learned at a young age can positively impact well-being and health (Fares et al. 2017; David et al., 2021). This is a highly relevant issue, as students' well-being is one of the fundamental goals of the renewed upper secondary school curriculum (OECD, 2019; Finnish National Agency for Education, 2019).

Exercise breaks are short periods that can be fit into work days or studies. In the ideal scenario, an exercise break would consist of both stretches and dynamic movements. The primary goal of these breaks is to balance the load caused by work or studying, promote recovery, and maintain mental endurance (Rauramo, 2008; Jindo et al. 2019). Shorts periods of exercise influence the circulatory system, muscles, and brain metabolism to improve alertness and concentration (Ylinen, 2002; Jindo et al., 2019).

Even light, short-term exercise has been shown to exert preventive effects on the development of musculoskeletal disorders, depression, and anxiety, as well as increase functional capacity, self-confidence, alertness, stress tolerance, and academic performance (Carson et al., 2016; Tremblay et al., 2016; TEKO, 2021a). Moreover, several studies of school-age children suggest that exercise breaks can contribute to factors that promote effective learning (Chaddock et al., 2010; Reed et al., 2010). For example, an intervention in which school-age children were subjected to 5-20 minutes of physical activity yielded improvements in the students' ability to concentrate (Grieco et al., 2009; Howie et al., 2014a; Howie et al. 2014b; Carlson et al. 2015).

It has been established that exercise breaks impart positive effects on stress and its symptoms, neck and shoulder problems, and student learning. For this reason, it is relevant to study upper secondary students` experiences of how exercise breaks can support their studying ability and well-being. The presented findings could be pivotal to helping students better understand their health and identify practices that will maintain their physical and mental well-being. There are no previous reports concerning upper secondary students' experiences of how exercise breaks affect their neck and shoulder pain and mental strain.

Methods

Research Aim and Research Questions

The presented research aimed to describe upper secondary school students' experiences of how exercise breaks support their studying ability and well-being.
The research questions were:

(1) How do students experience studying in upper secondary school?
(2) Do upper secondary level students feel that exercise breaks support their studying ability and well-being?

Research Design

A qualitative research method, including content analysis, was chosen to provide rich qualitative descriptions of participants' experiences with the studied phenomenon (Elo & Kyngäs, 2008).

Participants

This study included a total of 15 participants, all first-year upper secondary students, of which eight were female and seven were male. The average age of the participants was 16 years; the youngest students were 16 years of age while the oldest students were 17 years of age. The participants were selected from a Finnish upper secondary school by purposeful sampling (Polit & Beck 2020). Since the target group must have experiences of the researched phenomenon (Polit & Beck 2020), all of the participants took part in a guided exercise session once a week for three weeks. The break exercise was done in a group, approximately 10 minutes per session, during a lesson on a regular school day. The break exercise was planned by the researcher, who is a physiotherapist. The break exercise session consisted of dynamic stretches and active movements to improve mobility and whole-body posture. The participants were also given written instructions on how to do the performed exercises on their own. The selection criteria for participation in the study were as follows: being an upper secondary school student; having participated in exercise breaks; regularly participating in exercise breaks; and showing willingness to participate in the study. The students were introduced to the study through a cover letter that was forwarded to one class of first-year upper secondary school students (N=30) by the principal of the investigated educational institution. The participation rate was 50%, as 15 of the 30 students participated in the research.

Data Collection

The data were collected through semi-structured interviews (Polit & Beck, 2020). The interviews were face-to-face interviews that covered the following themes: well-being in upper secondary school; and exercise breaks. These interview themes were identified based on previous literature. The themes were pretested on two volunteer students, and these test interviews were used in the final data analysis because they met the inclusion criteria. Each interview lasted approximately 40 minutes. The research includes a sufficient number of interviews and study material as data saturation was achieved during the study (Polit & Beck, 2020).

Data Analysis

The interviews were saved as audio files and transcribed into a Microsoft Word (Microsoft, Redmond, WA) document. The data were analyzed according to inductive content analysis, during which the data were reduced and grouped into subcategories, and then further into main categories. The analysis was started by identifying sections of the text that correlated to one of the research questions and by identifying common themes based on the initial coding (Elo & Kyngäs, 2008; Kyngäs, 2020). The researchers read through the interview answers several times before identifying open codes and organizing them into categories (Polit & Beck, 2020). A total of 140 open codes describing upper secondary students' experiences was identified from the raw data for the first research question. The open codes were classified into subcategories (41) and categories (8). Concerning the second research question, a total of 42 open codes describing upper secondary students' experiences was withdrawn from the raw data. The open codes were classified into subcategories (9) and categories (3). The categories were then used to create main categories based on their relevance to the studied phenomenon. One researcher (NF) conducted data analysis, while the other researchers discussed the findings (HMK, KM) so that

the result could be verified. Original quotations have been added to the text to clearly describe the students' experiences of exercise breaks (Kyngäs, 2020).

Ethical Issues

Good scientific research practices were followed throughout the research process. The research met the requirements of ethics and reliability, which means that the results can be considered credible. There was no need to request an ethical review from a human sciences ethics committee because the participants were over 15 years of age, and their consent was sufficient for participation in the study (TENK, 2019). Research approval was applied for, and granted by the principal of the upper secondary school.

Participants were informed about the study via an information letter, with each student giving written consent to participate in the study. Participants were afforded the opportunity to ask for more information about the research by email or by calling one of the researchers. Participation in this study was entirely voluntary, and participants were given the possibility to withdraw from the study without a particular reason (Polit & Beck, 2020). The participants were informed that the recorded audio files would be securely stored and protected by passwords. All of the collected material was treated confidentially, and the research material was processed only by the researchers according to the General Data Protection Regulation (GDPR, 2016). Subject anonymity was respected and considered according to the ethical principles of human privacy, autonomy, data security, confidentiality (Declaration of Helsinki, 2013). No participant can be identified from the reported findings (Polit and Beck, 2020). It is also important to note that none of the researchers had any personal ties or prior relationships with the students who participated in the study.

Results

Upper secondary school students' experiences of their studies could be divided into three main categories, while upper secondary students' experiences of exercise breaks and the effects on studying ability were included in one main category. The first main category describes aspects that upper secondary students perceive as a burden, the second main category describes upper secondary students' experiences of distance learning during the Covid-19 pandemic, the third main category describes how upper secondary school impacts psycho-physical well-being, and the fourth main category describes the positive effects of exercise breaks on studying ability and psycho-physical well-being. These categories are presented in more detail in Tables 1 and 2.

Table 1 Upper Secondary School Students' Experiences of Studying in Upper Secondary School

Subcategories	Category	Main categories
Studies more demanding than before Sudden independence in studies More responsibility for studies than before	Increased requirements and responsibilities	Aspects burdening upper secondary studies

The studies are more burdening Studies are time consuming Lack of time No time for doing tasks properly The demanding nature of studies affects leisure time	Increased influence of workload and lack of time	
Getting a good grade requires more work Concern about the impact of grades on future studies Grades have dropped	Influence on academic success	
Increased sitting by the computer Increased long-term sitting Increased sitting is wearing	Increased sedentary in upper secondary school	
Distance learning has increased sitting by the computer Distance learning has increased the workload Sitting at a computer for distance learning is considered burdening Distance learning has increased overall sitting An end to distance learning is desired	Distance learning during the Covid-19 pandemic and its influence on the sedentary	Covid-19 influence upon upper secondary students' learning
Distance learning made it challenging to study and learn Distance learning has affected the grades Distance learning has reduced motivation The effects of distance learning on concentration	Distance learning and resilience in learning	
Comparing oneself with others increases stress Increased responsibility causes stress Distance learning is stressful Lack of time causes stress Workload causes stress Stress caused by grades Unclear assignments increase stress The stress of others increases stress	Aspects that increase stress in upper secondary school	The influence of upper secondary school studies on psycho-physical well-being
Increased fatigue Sweating	Mental and physical strain	

Effects on sleep quality
Neck pain
Headaches
Leg cramps
Causes poor posture
Feeling stress affects well-being

Table 2. Upper Secondary School Students` Experiences of At-work Exercise Supporting their Studying Ability and Well-being

Subcategories	**Category**	**Main categories**
Positive effects of different kinds of exercises Less pain related with musculoskeletal problems	At-work exercise had a positive influence to physical well-being	Perceived benefits of at-work exercise on study ability and psycho-physical wellbeing in upper secondary school
After at-work exercise one has more energy to do task At-work exercise has made studying easier At-work exercise has improved concentration	At-work exercises positive influence on study ability	
At-work exercise has increased coping At-work exercise has increased the energetic feeling At-work exercise has a positive effect on well-being At-work exercise is considered healthy	The influence of at-work exercise on mental well-being.	

Aspects Perceived as a Burden to Studies

The aspects which upper secondary students perceive as a burden were organized into four categories, namely,

1) increased requirements and responsibilities,
2) increased influence of workload and lack of time,
3) influence on academic success, and
4) increased sedentary behavior in upper secondary school.

The participating students expressed that the demands and responsibilities associated with studies had increased with the transition to upper secondary school. The studies were perceived as more demanding and burdening than what the students had experienced at the upper level of comprehensive school, studies which some of the students even considered easy. Students felt that they had to quickly grow up and become independent with the transition

to upper secondary school. Students also expressed that they were expected to take more responsibility for their studies with the transition. One student shared the following: "I had it pretty easy in middle school, but now it is all on me to make sure that everything is done and that I take all the right courses." (H5)

The interview responses revealed that the students found the workload and lack of time to be challenging. The students said it was challenging to get all of the tasks done correctly because of the workload and sheer number of assignments; the perceived challenges were primarily related to a lack of time. Studying was described as time-consuming, and the students felt that studies interfered with their leisure time. Several students emphasized that the deadlines of various assignments often accumulated on the same days. For example, one student stated: "It gets stressful, some days you have no homework, but then on some other days you have too much, that should be divided to several days so you would not get everything at once." (H2). Another student stated: "Sometimes you get so stressed that you think 'will I have time to do everything that should be ready today?". (H6)

The upper secondary students were also worried about their academic success. Achieving good grades was perceived to be more challenging than in the upper level of comprehensive school. Students felt that their grades had declined with the transition to upper secondary school; this was perceived as a challenge because the students felt that grades play an essential role in progressing to higher education future studies. This was expressed by one student as*:* "I get worried that my grades are getting worse. What if I do not get into the school I want [later]?" (H13). Another student stated: "The transition from the upper level of comprehensive school to upper secondary school has been like, upper secondary is much more difficult. There are some subjects that I now have lower grades in because it is more demanding, exactly in the subjects that I used to be good at in upper-level comprehensive school." (H1)

According to the participating students, the transition to upper secondary school included an increase in extended periods of sitting. Students described that a large portion of the tasks and assignments were performed on a computer, which naturally increased the time that they spent sitting. When asked about their sedentary behavior, they specified that sitting during both lessons and recess had increased, while they then sat more at home while using a computer or phone. The students felt that this increased amount of sitting was tiring and affecting their ability to concentrate. According to one student: "Almost everything is done on the computer, and there is much sitting." (H11) Another student stated: "Sometimes my mom asks me if I am stuck to the chair because I sit so much, but we have too much homework." (H9)

Influence of the COVID-19 Pandemic on Upper Secondary Students' Learning

The influence of the Covid-19 pandemic on upper secondary students' learning was described by two categories: 1) distance learning during the Covid-19 pandemic and its influence on sedentary behavior; and 2) distance learning and resilience in learning. Students reported that the transition to distance learning during the Covid-19 pandemic further increased the time they spent sitting. The students primarily participated in distance learning via a computer. Students reported that sitting at a computer for long periods while doing remote schoolwork was particularly straining. The participants also expressed hopes that the distance learning would end as soon as

possible. One student stated: "I am so tired of staring at the screen and just sitting and listening, I am not feeling well because of this." (H4)

Upper secondary students felt that distance learning had negatively affected their learning and the ability to study. They pointed out that it had become challenging to obtain teacher guidance during distance learning, while independent assignments had made learning more difficult. The students reported that they generally achieve good grades, yet the distance learning had harmed their grades, which they perceived as unfair. Distance learning had also reduced study motivation. Students felt that the home environment included too many distractions, which made it challenging to concentrate. One student shared: "It has become more difficult in school with corona and distance learning. You do not learn as much, and it is harder to be at a distance than if you were allowed to be at school." (H13). Another student discussed the effects of distance learning as: "The remote studies have affected me so much. It has been more difficult at distance [learning], as you do not have a teacher face-to-face; for example, in mathematics we have only received assignments, so there has been more self-studying." (H11)

The Influence of Upper Secondary School Studies on Psychophysical Well-being

The influence of upper secondary school studies on students' psychophysical well-being was covered by two categories: 1) aspects that increase stress in upper secondary school; and 2) mental and physical strain. The participating upper secondary students experienced substantial stress on many different levels. Increased responsibility for their studies, increased workload, lack of time, and procrastination until the last second were highlighted as stress-increasing factors. Achieving good grades, comparing oneself to others, and ambiguous assignments were other issues that the students felt increased stress. Moreover, the students felt that stress was contagious, i.e., stress that was visible in other students also increased stress. As an example, one student shared: "Although I have a clear view of the upcoming deadlines and so on, the assignments and writing tasks require a lot, and I feel high levels of stress." (H3)

Upper secondary school studies were associated with both mental and physical strain. The participating students shared experiences of fatigue, difficulty falling asleep, and poor sleep quality. One student stated: "I sometimes have a hard time falling asleep, as there are many thoughts spinning in my head." (H8). The students also reported experiencing various physical symptoms, such as increased sweating, neck pain and headaches, cramps in the lower extremities, and poor posture. As an example, one student reported: "If many tasks must be done during the same evening, I get a headache, and I get tired in the body, but maybe even more mentally tired." (H13)

Effects of Exercise Breaks on Upper Secondary School Students' Studying Ability and Psychophysical Wellbeing

The perceived benefits of exercise breaks in upper secondary school fell under three categories: 1) exercise breaks positively influence physical well-being; 2) exercise breaks positively influence studying ability; 3) influence of exercise breaks on mental well-being. The participating upper secondary students felt that exercise breaks positively affected their physical well-being. They reported that exercise breaks improved flexibility and reduced

neck pain, headaches, and back pain. For example, one student shared the following experience: "I have not had as much pain and aches in the body as I usually have." (H3). Another student stated: "Before the exercise breaks [started], I was a bit stiff in my body and felt tired and out of energy, but afterward it felt like I had gained new energy, or as if I had just woken up and was like, LET'S DO THIS, so the exercise was like a positive thing." (H9) The upper secondary students also felt that the exercise breaks positively affected their ability to study. They felt that studying was more manageable after an exercise session, and that they could do more assignments and reading homework. Additionally, the students shared that exercise breaks improved their ability to concentrate while doing homework. One student stated: "Usually I have a hard time maintaining my concentration and want to give up. Now, after starting these exercise breaks, I have the energy to get back to homework and to do more." (H9)

The participating students reported that the exercise breaks impacted their mental well-being. Based on the interview responses, exercise breaks increased overall endurance and gave students the sense that they had more energy. Students also stated that their mood improved and they felt happier after an exercise session. Several direct quotations from the students include: "Most of the time I have been tired and unable to concentrate, but after an exercise break I got more energy, I also felt happier" (H1); and "It is like a pause when you can rethink, and maybe do a little better. And you do not have to have the fast pace but can take a break and take it easy." (H5)

Discussion

Gathering students' perceptions of their upper secondary school studies was essential for describing their experiences of how exercise breaks can impact their well-being and ability to study. The interviewed students perceived several aspects of upper secondary school as a burden. For example, the students felt that upper secondary school was more demanding and challenging than upper-level comprehensive school. These findings agree with what has been presented in previous research, i.e., upper secondary school studies are often perceived as difficult, time-consuming, and associated with a risk of school fatigue (Walburg 2014; Dupéré et al. 2015; Salmela-Aro & Hietajärvi, 2019). Previous research into school fatigue has found that this psychosomatic symptom seems to increase as students begin upper secondary school (Zeedyk et al., 2003; Salmela-Aro, 2010; Evans et al., 2018).

Upper secondary school is seen as the stage of education during which students become independent and find their place in society (Finnish National Agency for Education, 2021). However, the students participating in this study felt that they had to grow up and become independent faster than they anticipated. Concerns about academic success emerged from the interviews, with students adamant that good grades play a significant role in postgraduate studies. The importance of grades has recently been found to increase the workload and stress experienced by upper secondary students (Vallinkoski, 2020).

The participating students also shared that upper secondary school was associated with an increase in screen time and extensive periods of sitting by a computer. This type of sedentary behavior was perceived as tiring and caused concentration difficulties. Previous studies have shown that extended periods of sitting and the excessive use of electronic devices among adolescents can lead to psychosomatic symptoms and neck-shoulder problems (Hakala

et al., 2000; Vikat et al., 2000; Ståhl 2014; 2014; Fares et al. 2017; David et al., 2021). Studies have also shown that the prevalence of multi-site muscoskeletal pain has increased among adolescents, and may be linked to increased levels of anxiety and psychological distress (Auvinen et al., 2016; Fares et al., 2017; David et al. 2021). The students also reported that the transition to distance learning caused by the Covid-19 pandemic increased their sedentary behavior and resulted in more time spent sitting by the computer. The students did not appreciate the increased amount of independent assignments that they received during distance learning periods, and felt that this form of teaching was overly complicated and negatively affected their study motivation. These findings agree with what was reported in a case study by Niemi and Kousa (2020) and a survey conducted by The Union of Upper Secondary School Students in the spring of 2020. More specifically, results from both studies indicate that upper secondary students experienced motivational problems and difficulties concentrating during distance learning (Niemi & Kousa, 2020; The Union of Upper Secondary School Students, 2020).

Previous research has shown that a student's workload and the need to perform at a high level can negatively affect adolescents' well-being, both during leisure time and at school (Salmela-Aro et al., 2008; Salmela-Aro, 2010; Randall et al. 2019; Bortes et al. 2021). In this study, students experienced fatigue and sleep-related problems. In addition, they reported that enrolling in upper secondary school had increased certain physical problems, e.g., sweating, neck pain, and headaches. The participating students also felt that they were experiencing excessive stress, which resulted in mental and physical strain. These findings are supported by the results of the Upper Secondary School Barometer 2019 survey, in which sleep problems, depression, and muscle aches were common symptoms related to studying (Salmela-Aro & Näätänen, 2005; Randall et al. 2019).

When asked about their experiences with exercise breaks, the participating students shared that this form of exercise positively influenced their studies, as well as physical and mental well-being. The students felt that regular breaks which included exercise reduced neck pain, back pain, and headaches. These findings agree with previous reports that even small amounts of exercise can relieve neck and shoulder pain in adults (Andersen et al., 2011; Escriche-Escuder et al. 2020). A novel finding of the present study was that upper secondary students feel that exercise breaks are beneficial to studies as they help students cope with stress, concentrate, and feel energized. The students also felt happier after doing the exercises. Prior studies of school-age children have demonstrated that exercise breaks can promote the skills needed for learning, and that 10-20-minute exercise sessions improve students' ability to maintain concentration relative to school days without exercise sessions (Grieco et al., 2009; Howie et al. 2014a; Howie et al. 2014b; Carlson et al. 2015). Studies in adults have yielded similar results; for example, exercise breaks reduced various painful symptoms, such as headache and neck pain, along with back pain, among office workers (Escriche-Escuder et al., 2020). Overall, this suggests that short periods of exercise could exert a preventive effect on some of the psycho-physical problems commonly experienced by upper secondary school students.

Study Limitations and Trustworthiness

This study includes some inherent limitations. The data were collected from students representing only one school class in one specific upper secondary school; for this reason, the presented results are not directly transferable to

other upper secondary schools (Polit & Beck, 2020). The trustworthiness of the research was ensured by considering the aspects of credibility, dependability, confirmability, authenticity, and transferability. Credibility was enhanced by clearly describing the limitations and strengths of the study and the relationship between the results and data. The dependability of the research was increased by portraying the study progress as clearly and logically as possible. As such, the various steps of inductive content analysis were accurately and systematically described to ensure that readers could understand the analytical process. The data and analysis are presented through two tables to ensure the trustworthiness and transferability of the research. Confirmability was increased by the fact that the results describe the original data. The authenticity of the study has been increased by using direct quotations from the interviews (Kyngäs, 2020.) The reliability of the research was increased by adhering to the Standards for Reporting Qualitative Research (SRQR) checklist (O'Brian et al., 2014).

Conclusion

The presented results show that students experience upper secondary school as burdensome. The excessive workload, extended sitting due to school assignments and distance learning, rising demands and worrying about academic success were reasons experienced causing physical and mental strain. Based on the interview responses, the students felt that exercise breaks positively influence their studying ability and well-being (both physical and mental). Moreover, the students felt that the exercise breaks were a great way to get a break from schoolwork and decrease the extended periods of sitting. The students also reported that these breaks helped them concentrate and gave them the energy needed to study more effectively.

An important finding in this study is that upper secondary school must research and implement actions that will support students in the stressful period of their education. Based on the presented results, one possible way to improve students' well-being and studying ability is to integrate exercise breaks into schooldays. However, it should be noted that this is only one way to support students' well-being, and students, teachers, and other administrators should be aware that further support methods are needed for students to feel comfortable in the upper secondary school environment.

We found that there is limited research concerning the effects of exercise breaks on upper secondary students' well-being and studying ability. In the future, a longitudinal study could provide crucial insight into how exercise breaks benefit upper secondary students over time. This type of research would also provide the evidence-based data that are necessary for determining how to educate teachers about the health-promoting benefits of exercise breaks. The present study also provides worrying results about the sedentary behaviour of upper secondary school students; this issue should be acknowledged so that long-term measures for improving motility can be implemented.

Acknowledgments

We would like to acknowledge Sees-Editing Ltd (http://www.seesediting.co.uk) service for improving the language and helping us to communicate our findings to readers of the journal.

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