

SPORMETRE

The Journal of Physical Education and Sport Sciences Beden Eğitimi ve Spor Bilimleri Dergisi



DOI: 10.33689/spormetre.1451397 Research Article

Geliş Tarihi (Received): 05.04.2024

Kabul Tarihi (Accepted): 18.12.2024

Online Yayın Tarihi (Published): 30.12.2024

OPPORTUNITIES AND BARRIERS IN CHILDREN'S ACQUISITION OF PHYSICAL ACTIVITY HABITS*

Özge Sütcü Pektaş¹, Hidayet Suha Yüksel^{2†}

¹Ankara Üniversitesi, Eğitim Bilimleri Enstitüsü, ANKARA

²Ankara Üniversitesi, Spor Bilimleri Fakültesi, ANKARA

Abstract: It is increasingly recognized that sedentary lifestyles are becoming more prevalent among children. The absence of regular physical activity among school-age children results in the adoption of a sedentary lifestyle, which has a detrimental impact on their health and well-being. From this perspective, the objective of this study is to examine the opportunities and barriers encountered by children in the process of acquiring physical activity habits from the perspective of teachers. A case study, which is a qualitative research design, was employed in the study. A total of 23 physical education teachers participated in the study. A semi-structured interview format comprising 10 questions was employed to elucidate the impediments and opportunities encountered by children in the process of acquiring physical activity habits. The opportunities and barriers in the process of acquiring physical activity habits were presented under 6 themes (physical education class, school-based physical activity, motivation, physical competence, interaction with the environment, knowledge and attitude). The central role and quality of physical education class and school-based physical activity are among the important determinants of this process. In addition, it is necessary to understand the opportunities and barriers related to motivation, physical competence, interaction with the environment, and knowledge and attitude, which are among the important components of the process of lifelong physical activity habits. In this process, the teacher's approach, school location, friends/family support and ease of access to information emerged as some opportunities. The duration of the course, inadequate school facilities, the attitude of the family and exam anxiety were some of the barriers to this process.

Keywords: Physical activity habit, physical education, physical education teacher, barriers, opportunities

ÇOCUKLARIN FİZİKSEL AKTİVİTE ALIŞKANLIĞI EDİNME SÜRECİNDEKİ FIRSAT VE ENGELLERİ

Öz: Günümüzde çocuklar arasında hareketsiz yaşam tarzının sürekli arttığı bilinmektedir. Okul çağındaki çocukların düzenli fiziksel aktivite yapmamaları onları olumsuz etkileyen hareketsiz bir yaşam tarzı sürmelerine sebep olmaktadır. Bu noktadan hareketle bu çalışmanın amacı çocukların düzenli fiziksel aktivite alışkanlığı edinme sürecindeki fırsat ve engelleri beden eğitimi ve spor öğretmenlerinin bakış açısından incelemektir. Çalışmada nitel araştırmanın bir deseni olan durum çalışması kullanılmıştır. Çalışmaya 23 beden eğitimi öğretmeni katılmıştır. Çocukların düzenli fiziksel aktivite alışkanlığı edinme sürecindeki engellerini ve fırsatlarını açığa çıkarmak için 10 sorudan oluşan yarı yapılandırılmış görüşme formu kullanılmıştır. Fiziksel aktivite alışkanlığı edinme sürecindeki fırsat ve engeller 6 tema (beden eğitimi dersi, okula dayalı fiziksel aktivite, motivasyon, fiziksel yeterlik, çevreyle etkileşim, bilgi ve tutum) altında sunulmuştur. Beden eğitimi dersinin merkezi rolü ve niteliğiyle birlikte okula dayalı fiziksel aktivite bu sürecin önemli belirleyicileri arasındadır. Bununla birlikte yaşam boyu fiziksel aktivite alışkanlığı sürecinin önemli bileşenleri arasında olan motivasyon, fiziksel yeterlik, çevreyle etkileşim ile bilgi ve tutuma ilişkin fırsat ve engelleri anlamak gerekmektedir. Bu süreçte öğretmenin yaklaşımı, okulun konumu, arkadaş/aile desteği ve bilgiye erişim kolaylığı bazı fırsatlar olarak ortaya çıkmıştır. Dersin süresi, okul imkanlarının yetersizliği, ailenin tutumu ve sınav kaygısı gibi konular ise bu sürecin bazı engelleri olarak ortaya çıkmıştır.

Anahtar Kelimeler: Fiziksel aktivite alışkanlığı, beden eğitimi, beden eğitimi öğretmeni, engel, fırsat



^{*} This study is derived from the master's thesis titled "Evaluation of children's opportunities and barriers in the process of acquiring regular physical activity habits in terms of physical education teachers"

[†]Corresponding Author: Hidayet Suha YÜKSEL, Assoc. Prof., E-mail: <u>hsyuksel@ankara.edu.tr</u>

INTRODUCTION

In recent years, school-aged children have been shown to have lifestyles that are physically inactive. A sedentary lifestyle during childhood has been associated with an elevated risk of developing a variety of health concerns. Moreover, as a consequence of societal shifts in lifestyle, children and adolescents are currently experiencing a dearth of physical activity (Owen, Parker, Astell-Burt, & Lonsdale, 2018). Children who are not active on a daily basis and who spend the majority of their time in a sedentary state may lack the requisite physical fitness to engage in physical activity. Moreover, a deficiency in physical fitness has a deleterious effect on the child's multidimensional development. The commencement of physical activity during the early years of life has been identified as a significant predictor of future health and well-being (Makar, 2016). It is recommended that children engage in 60 minutes of moderate-to-high intensity physical activity almost every day of the week in order to positively impact their health (Nader et al., 2008). During childhood, children engage in a greater quantity of physical activity than adults. While this is widely acknowledged, research indicates that the majority of preschool children (77%) engage in sedentary activities for the majority of their waking hours (Willoughby et al., 2018). The adoption of healthy lifestyle habits during childhood is associated with a reduced risk of developing diseases that impact human health, such as obesity, throughout the lifespan. Furthermore, research has demonstrated that physical activity exerts a beneficial influence on academic achievement, mental wellbeing, and physical health (Chenoll et al., 2015).

The initiation of regular physical activity at an early age constitutes a lifelong habit that confers benefits to the individual (Satman, 2018). A growing body of evidence indicates that children who engage in healthy lifestyle activities from an early age are more likely to lead a physically active lifestyle in adulthood (Thomas et al., 2020; Yuksel et al., 2020). The formation of healthy living habits at an early age may prove to be a significant factor in the prevention of health problems that may arise in later life. One of the factors that has a beneficial impact on lifestyle and health levels is the amount of time spent in active pursuits (Bulut, 2013). It is therefore imperative to encourage children to engage in physical activity and to investigate feasible strategies for the prevention and control of obesity (Hu et al., 2003). There may be a number of reasons that affect a child's motivation to engage in regular physical activity. In this process, the student's cognitive characteristics, individual differences, and environmental factors play a significant role. Furthermore, environmental factors that influence student participation in regular physical activity and personal characteristics such as self-confidence and reluctance contribute to low motivation in children (Demir & Cicioğlu, 2018). Furthermore, the child's awareness of the physical and psychological advantages associated with regular engagement in physical activity can serve as a crucial determinant in maintaining continuity. Another concept that is important regarding children's involvement in physical activity is that of physical competence. A child's level of physical competence can have a significant impact on their engagement in physical activity. A child's level of physical competence may serve as a determining factor in their inclination to engage in physical activity, either as a deterrent or as an incentive. Harter (1985) asserts that a child's perception of physical competence has a positive effect on both success in activities and participation in activities. He emphasizes the importance of this perception in the motivation process, stating that individuals who perceive themselves as competent are intrinsically more motivated to participate at high levels and are more persistent and less anxious during their participation (cited in Sollerhed et al., 2007).

The incorporation of quality physical activity in children's school environments represents a crucial aspect of the solution (Naylor and McKay, 2009, cited in Naylor et al., 2015). Schools

serve as pivotal locations for the advancement of lifelong healthy eating and physical activity practices, as well as the prevention of childhood obesity (Xu et al., 2012). School environments offer valuable opportunities for children to engage in regular physical activity. Physical education and sports lessons that are designed with a contemporary pedagogical approach include programs that afford students the opportunity to develop their skills in a variety of ways (Esen, 2010). Physical education classes facilitate the formation of physical activity habits in children, which can then be sustained throughout their lives. In addition to the acquisition and development of psychomotor abilities, physical education classes seek to instill healthy habits and encourage engagement in physical activities during leisure time (Kale & Ersen, 2010). Furthermore, the availability of suitable facilities at educational establishments is a significant determinant of children's engagement in physical activity. Students engage actively with the school garden and sports halls during physical education classes, including recess. The motivation of the child to engage in physical activity and the quality of life are influenced by the environment in which they participate. Outdoor playgrounds and sports halls, which are within the school's facilities, facilitate socialization and enhance the quality of life (Algan & Uslu, 2009). It is therefore crucial to organise the physical facilities of the school, which students utilise during both their free time and lessons, in a manner that encourages student participation in activities. Given that students spend the majority of their time at school, promoting their involvement in physical activity and facilitating the integration of physical activity into their daily lives during their formative years is of paramount importance for their overall development (Vural & Yılmaz, 2016).

One of the most significant factors influencing students' engagement in physical activity is the quality of instruction provided by their physical education teacher. Children frequently emulate their teachers' behaviors with regard to participation in activities. For this reason, the conduct of the instructor in establishing the learning environment and their approach to the students is of paramount importance. The manner in which teachers communicate with their students can influence their level of participation in physical activity. Providing students with regular feedback and support can positively influence their motivation to engage with the lesson. The distinguishing factors of physical education lessons are their typically outdoor setting and the use of specialized equipment and tools. The distinctive features of physical education that differentiate it from other academic disciplines impose specific responsibilities on those who teach it. These responsibilities highlight the social and cognitive characteristics of physical education teachers in a manner that differs from the responsibilities of teachers in other disciplines (Yılmaz, 2018). The responsibility for increasing physical activity opportunities in schools and utilizing them effectively primarily falls upon physical education teachers. Given that physical education teachers are ideally positioned to comprehend and address the school environment, familial influences, the interconnectivity of physical activity, and most crucially, children's necessities for physical activity, it is incumbent upon the physical education teacher to facilitate opportunities for physical activity (Castelli & Beighle, 2007). The frequency with which children engage in physical activity or participate in regular physical activity is influenced by a number of factors. Consequently, it is essential to assess the various elements influencing the formation of children's physical activity habits. Given that a substantial portion of childhood is spent in educational settings, it is crucial to incorporate the pivotal role of schools in the formation of habits into the evaluation process. School environments have the capacity to facilitate the provision of opportunities for all children to engage in physical activity, irrespective of socioeconomic and cultural status (Dwyer et al., 2006). In this context, it is of significant importance to gain an understanding of and evaluate the opportunities and barriers inherent in the process of school-age children acquiring physical activity habits from the perspective of physical education and sports teachers, who occupy a position of leadership in the context of school-based physical activity (SBPA).

Accordingly, the aim of this study is to examine the opportunities and barriers affecting the process of regular physical activity participation of school-age children from the perspective of physical education teachers. In this context, the following questions were sought to be answered in the study:

- 1) What are the opportunities for children in the process of acquiring physical activity habits?
- 2) What are the barriers for children in the process of acquiring physical activity habits?

METHOD

Research Design and Participants

Case study, one of the qualitative research designs, was preferred in the study. Case study is a method in which the data are systematically gathered together in order to fully examine the event to be investigated and how the reality is in its own context (Subaşı & Okumuş, 2017). More specifically, the case study focuses on explaining the current situation of the events without intervention in important details by revealing the events experienced by the participants and the conditions in which they live by asking the researcher 'how' and 'why' questions (Yin, 2009). In the study, an in-depth interview was conducted with physical education and sports teachers to examine different aspects of opportunities and barriers in the process of acquiring physical activity habits.

The maximum diversity sampling technique, one of the purposeful sampling methods, was employed to identify the participants for the study. In order to ensure diversity among the selected study group, variables such as geographical location, educational setting (secondary and high schools), years of service, and gender were taken into account. A total of 23 physical education and sports teachers were selected to participate in the study, with the aim of ensuring diversity in terms of geographical location (rural vs. urban) and length of service (at least two years). This resulted in eight teachers from rural areas and 15 from urban areas being included in the study (Table 1).

Table 1. Characteristics of the participating teachers

<u>Participant</u>	Gender	City	Year of Service	School Type
PT1	Male	Ankara	2	High School
PT2	Male	Van	5	Middle School
PT3	Male	Konya	5	Middle School
PT4	Male	Erzurum	3	Middle School
PT5	Woman	Karabük	2	Middle School
PT6	Woman	Istanbul	16	Middle School
PT7	Male	Sanliurfa	3	Middle School
PT8	Male	Kars	3	High School
PT9	Male	Ankara	2	Middle School
PT10	Male	Gaziantep	2	Middle School
PT 1	Woman	Izmir	15	Middle School
PT12	Male	Ankara	9	Middle School
PT13	Woman	Eskisehir	21	High School
PT14	Woman	Ankara	30	High School
PT15	Male	Ankara	5	High School
PT16	Woman	Ankara	10	Middle School
PT17	Male	Ankara	23	Middle School
PT18	Male	Ankara	18	Middle School
PT19	Male	Ankara	23	Middle School
PT20	Woman	Muğla	9	Middle School
PT21	Woman	Ankara	11	High School
PT22	Woman	Ankara	29	High School
PT23	Woman	Ankara	31	High School

Data Collection

A semi-structured interview form was used to understand the opportunities and barriers in the process of regular physical activity participation of school-age children from the perspective of physical education and sports teachers. The semi-structured interview form was prepared from questions that include the concepts of motivation, environment, physical competence and knowledge, which are important in the process of acquiring physical activity habits within the framework of Whitehead's (2010) physical literacy cycle. The interview form used in the research consists of 10 questions. After the interview questions were prepared in this framework, an expert opinion was taken and the questions were organized and prepared accordingly. The interviews with the teachers lasted an average of 30 minutes. The interviews were conducted face-to-face or online. The online interviews were conducted through the Zoom program. During the interviews, additional questions were asked to the teachers in line with the answers given by the teachers. These additional questions were not asked to direct the teachers to the desired answer, but to understand the thoughts behind the answer. The reasons for conducting the interviews online were the transportation problem arising from the fact that the teachers were working in different cities, as well as the fact that the current academic year coincided with the Covid 19 pandemic period. With the permission of the participants, audio recordings were taken to be used in data analysis. This study was conducted with the approval of the ethics committee dated 12.04.2021 and numbered 125.

Analyzing the Data

Content analysis method was used to analyze the data obtained. Content analysis is defined as the categorization and summarization of a text with smaller content through specific coding (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2010). In the context of these definitions, the audio recordings obtained from the interviews were converted into written text by the researchers. Then, the data were processed one by one in the MAXQDA 2020 program, which helps data analysis of qualitative research. The processed data were read one by one by the researchers and related concepts were identified. The identified concepts were brought together in the coding phase and the expressions appropriate to these concepts were divided into themes under a higher heading. The tabular representation of the data is given in the findings section using the code names of the participants.

Credibility

In order to ensure the credibility of this research, the strategies of writing the process in detail in terms of the prfocess, obtaining expert opinion, using purposive sampling and diversifying the sample, defining the conceptual framework used in the analysis process, and including direct quotations were followed (Guba & Lincoln, 1982; Cited. Koca & Hünük, 2018; Savin-Baden & Major, 2013; Yıldırım & Şimşek, 2013). This research was conducted with the approval of the ethics committee dated 12/04/2021 and decision number 125.

FINDINGS

In the study, opportunities and barriers of children in the process of lifelong physical activity were presented under 6 themes. These themes and the main results are presented in Table 2.

Table 2. Opportunities and barriers of the lifelong physical activity habit process

1. Physical Education Lesson	2. School-based Physical Activity	3. Motivation	4. Physical Competence	5. Environmental Interaction	6. Knowledge and Attitude
Opportunities -The central role of the lesson -Interest and equipment of the teacher	Opportunities -Inter-school competitions -In-class activities -Activities carried out within	Opportunities -Teacher approach In-class activities -School resources -Role modeling	Opportunities -Being in the countryside Barriers -Life in the city	Opportunities -Friend -Teacher support -Family guidance	Opportunities -Teacher -Internet and media -Seminar
Barriers -Course duration -School facilities	the school	Barriers -Inadequacy of school facilities -Being grade- oriented -Environmental / Climatic Conditions -Family -Course duration		Barriers -Family attitude -Physical environment -Friend	Barriers -School Administration -Physical conditions -Resistance -Exam anxiety -Family

Physical Education Lesson

Physical education teachers consider physical education a central part of the process of teaching students to be physically active. They stated that the teacher's being interested and qualified is very important in the process of lifelong physical activity habits. However, despite the effective role of the course, they mentioned the insufficient duration of the lessons and inadequate school facilities.

Opportunities for Physical Education

Physical education teachers stated that physical education class is an opportunity for students in the process of acquiring physical activity habits. The teacher coded as PT22 stated that "physical education can be an opportunity for students to acquire the habit of regular activity, but if the teacher takes his/her job seriously and emphasizes the importance of physical fitness tests that will be necessary for him/her throughout his/her life, it will definitely be effective." PT13, on the other hand, said, "Yes, I think it is effective. I think it introduces sports to children who do not know about sports and gives them an idea about how to stay healthy". They showed that they thought that the children were introduced to sports in the physical education class and that they could get information about staying healthy afterwards.

Barriers to Physical Education Class

Although physical education classes are seen as an opportunity to ensure children's participation in regular physical activity, the insufficient number of class hours and the fact that children cannot meet the physical education teacher in primary school are seen as barriers by teachers. PT6 expressed these views as follows:

"I think it is effective, but it is insufficient and we cannot get the necessary effiency because we have time limitations. Only physical education is a lesson that should definitely be at the primary school level, starting from the first grade. Especially in childhood, but now in Turkey this lesson is taught by classroom teachers in primary schools. We meet children in the 5th, 6th, 7th, 7th and 8th grades. From the fifth grade. Therefore, it is a lesson that should definitely be sufficient."

At this point, teachers expressed the idea that physical education lessons should be given by physical education teachers from primary school onwards and that the duration of the lessons should be longer.

School-Based Physical Activity Programs

SBPA is one of the opportunities offered by the school in the process of acquiring physical activity habits. According to the teachers' views, inter-school competitions, in-class activities and activities carried out within the school came to the forefront as an opportunity for children to acquire physical activity habits. Teachers emphasized that school sport activities encourage children to engage in regular physical activity, reinforce a sense of accomplishment and are fun for students. SBPA programs were revealed only as an opportunity for students. The teacher coded BÖ12 said, "No matter which branch, even if it is a branch that the child is not interested in, we will establish a school team. We will go to competitions, we will go to a tournament, we will compete with other schools. When we say that we are going to compete, the children's desire and motivation increase a lot and they always want to participate. This motivates them a lot. I think school sports are important." In line with their views, school sports activities encourage children to be active and motivate them to be successful. In order for children to acquire physical activity habit, they need to participate in activities continuously and make them a part of their daily lives. School sports activities will also be an important opportunity for children when they are generalized based on teachers' views. Therefore, it can be seen as a motivating factor for children and teachers. In addition to these views, among the views of our teachers working in rural areas, school sports activities as a way for children to access sports are very important. Our teacher coded as PT7 expressed her views with the following statements: "It is of great importance. As I said, children here and in most eastern provinces cannot access good sports for social reasons. Because mothers and fathers are not interested. They can only entrust their children to teachers whom they can trust. With school sports activities, the teacher creates a social environment. In this social environment, the child develops himself/herself, not in a sportive sense. In other words, it helps them develop themselves as individuals." Participation in school sports activities is seen as an opportunity for children. Physical education teachers working in the city see SBPA as an important opportunity for children in terms of success, social development and acquiring physical activity habits.

Motivation

The factors that physical education teachers prioritized as affecting students' motivation were 'teacher', 'in-class activities' and 'school facilities'. The factors that teachers think affect children's motivation will be presented under the themes of opportunities and barriers.

Opportunities for Motivation

The codes belonging to the theme of opportunities related to motivation are presented in table

Table 3. Opportunity-themed coded list table on motivation

Opportunity	Frequency
Teacher	16
In-class activities	7
School facilities	6
Role Model	3
Enthusiasm	1
Development	1
TOTAL	34

When we look at the opportunities that affect children's motivation to participate, we see that the biggest source of motivation for children is the teacher. In-class activities, which are mentioned as another opportunity, are directly related to teacher competence. The teacher's caring attitude in the lesson and his/her respect for the lesson is stated as a direct motivating factor for children. The views of the teacher coded as PT3 "The thing that motivates our students the most here is the teacher of the lesson. I think that the more the teacher respects his/her own

work, the more he/she wants to convey something to the children, the more his/her efforts and success are reflected on the children." Participants stated that the teacher is the encouraging factor for children. In addition to these statements, the teacher's interest, respect for his/her profession and professional competence were seen as a great source of motivation for students. The statements of the teacher coded PT13 are as follows: "I see school facilities and school sports activities as opportunities for children to be motivated for regular physical activity." School facilities are another important factor in motivating children. Having an area where the child can do activities is seen as one of the great opportunities for motivating children for physical activity habits.

Barriers to Motivation

The list of factors that teachers perceive as barriers to students' motivation to engage in regular physical activity is given in Table 4.

Table 4. Coded list table with the theme of barrier to motivation

Barriers	Frequency
School facilities	8
Grade Oriented	1
Environment - Air	1
Family	1
Insufficient Class Hours	1
In-class activities	1
TOTAL	13

When the barriers list table above is examined, it is seen that while the presence of school facilities is an opportunity for children, their absence or scarcity can be a major barrier. A teacher coded PT4 said, "The facilities of the school are very important, for example, we do not have a sports hall in our school, unfortunately we cannot go out for about 5-6 months in Erzurum because of the winter conditions. We have a small hall, but unfortunately we cannot do every activity there. We can't play basketball, volleyball or soccer, we can do body weight movements in a small area with small balls." The teachers expressed their opinions as follows. Teachers' opinions show that the problem that prevents motivation is the inadequacy of school facilities. When school facilities are insufficient, the efficiency of the lessons and the motivation of the children decrease for students and teachers.

Physical Competence

When the teachers' views are analyzed, the physical competencies of the students differ as good, medium and low on the basis of urban and rural teachers' views. While teachers working in rural areas stated that children's physical competencies are good due to the geography they live in, teachers working in urban areas stated that children's physical competencies are low due to urban life. Teachers stated that students' physical competencies did not affect their participation in the lesson, except in some cases.

Opportunities for Physical Competence

The statements of teachers working in rural areas about children's physical competence show that their physical competence is in good condition and this is attributed to the fact that children are constantly active because they live in a village. The opinions of our teacher coded as PT4 are as follows: "Mostly good. I mean, it is appropriate, but unfortunately, those who do not participate are not good, but in general, let me talk about the boys in particular, since they are

engaged in agriculture and animal husbandry, they are physically very good, their muscle structure is very good, and physical activity is very high."

The reasons why children growing up in rural areas are more active are that they have areas where they can be active, they help their families who are engaged in agriculture and animal husbandry, and they are already physically active enough in daily life outside of school.

When we look at the relationship between physical competence and lessons, we can see that teachers working in rural areas think that this is not a barrier, on the contrary, children are eager to participate in activities. A teacher coded PT5 said, "There is none, they are very enthusiastic. They are very open, because they have not seen it before" shows that children's lack of activity positively affects their participation in lessons.

Barriers to Physical Competence

When we look at the teachers' views on physical competence, we see that they think that students living in the city have low physical competence. The teacher coded PT5 said, "Right now, there has never been a physical education teacher in my school before. At work, an eighth-grade student has learned how to turn left and right from me, or fifth graders are taking physical education for the first time. Their physical competencies are low because they could not get some competencies in primary school." When we look at the opinions of the teachers, the fact that children meet the physical education teacher late is again perceived as a barrier. In addition, when we look at the opinions of the teacher coded as PT20, "Unfortunately, physical competence is getting worse and the development of technology affects our children as it affects us. Factors such as virtual games such as computers and phones reduce the desire for physical activity and physical development is unfortunately negatively affected by this. These situations both reduce self-confidence in many children and reduce their desire for physical activity because they lead to conditions such as obesity." The opinions of urban teachers, on the contrary to rural teachers, are that physical competencies are quite poor because children are inactive and grow up with technology.

Environmental Interaction

The codes 'friends', 'teacher', 'family' and 'physical environment' emerged in line with the statements made by the teachers about environmental interaction.

Opportunities for Environmental Interaction

The coded list table of physical education teachers' statements on the environmental factor is given in Table 5.

Table 5. Coded list table of teachers' opportunity-themed statements about the environmental factor.

Opportunity	Frequency
Friend	14
Teacher	8
Family	3
TOTAL	25

The expression most frequently used by teachers under the theme of opportunity is 'friend'. The teacher coded PT8 expressed her views as follows: "I think they improve their relationships with their friends. Ninth graders especially know each other better. Thanks to my class. They have more contact with each other, they don't have such opportunities in other lessons. So I think it has a good effect." The code of friends, which is a common opinion, is seen as the biggest opportunity for children to participate in regular physical activity. Fun time activities that children spend with their peers are more attractive to them. This situation may affect the child positively and help them gain physical activity habits.

One of the common opinions is 'teacher' and the teacher coded as "When the teacher factor comes into play a little bit, after giving what actually needs to be given, when they start to issue a license when they have a little chat with the families, these students want to continue sports when they see that it is actually not a difficulty, but voluntary and actually such a source of motivation." He stated that the teacher can be an opportunity for children. When the child has a good relationship with the teacher, he/she will not hesitate to participate in classes. With the support of the teacher in in-school and out-of-school activities, they will aim to reach better places.

Barriers to Environmental Interaction

Table 6 presents teachers' statements about barriers to children's interaction with the environment when participating in regular physical activity.

Table 5. Coded list table of teachers' statements on the theme of barrier related to the environmental factor.

Barrier	Frequency
Family	17
Physical environment	15
Friend	3
TOTAL	35

The majority of teachers perceived the 'family' factor as a barrier. The environment is a major factor for children to acquire physical activity habits. A teacher coded PT4 said: "Actually, we cannot communicate with families much. In my school, especially irresponsibility is very high. For example, the child comes to school, but not with the encouragement of the family, but on his/her own, there is not much motivation among them" and a teacher coded as PT14 said, "We already have a school team for example. We are going to have 2 trainings a week, even for that, my teacher has to miss class because of the trainings. Like this, they think that it negatively affects the child's socialization and lessons." With these statements, she thinks that family is a barrier for children to participate in physical activity. Within the concept of environment, the family has a direct effect on the child. Children who are not supported or prevented by their families do not engage in physical activity. They may not see physical activity as a concept that they can integrate with their own lives.

Another common opinion is the 'physical environment' factor. The teacher coded as "For example, my students are students from a village school. When you say environmental factors, I think that the child is less likely to see many things in terms of sports branch, and if we include school facilities in this, I think that the environment, that is, the environment in which he/she is located, affects in this sense. With his/her opinions, the physical environment appears as a concept formed by elements such as school facilities, the environment where he/she lives, sports facilities, etc. If the child cannot see a formation in his/her immediate surroundings that will encourage him/her to do an activity, it will be difficult for him/her to participate in the activity. The physical environment is among the major barriers for children.

The code "friends" is seen as a barrier by teachers in some cases. Teacher coded PT16 said: "We may encounter these from time to time, such as friend grouping and not being included in that group and giving up that activity." When we look at the views of the teachers, the circle of friends can be perceived as a barrier to physical activity for the child. Exposure of the child to peer pressure may have negative effects on the child and he/she may refrain from doing physical activities and attending classes.

Knowledge and Attitude

Teachers stated that children's knowledge about the benefits of regular physical activity is insufficient and that 'teachers', internet and media', 'school administration', 'physical conditions', 'reluctance' and 'exam anxiety' are the main reasons for children's lack of knowledge.

Opportunities for Knowledge and Attitudes

The codes related to opportunities for children to develop knowledge and attitudes are presented in Table 7.

Table 7. Opportunities for knowledge and attitudes

Opportunities	Frequency
Teacher	9
Internet and media	7
Seminar	1
School	1
TOTAL	18

Opportunities for children to acquire knowledge and develop attitudes were seen as the teacher, the internet and the media where they could learn through research. Some teachers stated that they organized seminars in their schools to inform children about the benefits of physical activity. It is seen that the only opportunity for children is again the teacher. Theoretical and practical information provided by the teacher is a source of opportunity for children. When we look at obtaining information as an opportunity, we see that children's opportunities are the teacher and the internet and media opportunities as the ease of access to the internet where they can get information.

I tried to reflect this spirit, this atmosphere in my lessons. I mean, I am the only connection of children to sports. I started a few children in sports at school (PT1).

I try to explain them in extracurricular activities outside the classroom, such as courses, exercises, etc. (PT2).

Barriers related to knowledge and attitude

The barriers to children's knowledge acquisition and attitude development are presented in Table 8.

Table 8. Barriers related to knowledge and attitude

Barriers	Frequency
School Administration	15
Physical conditions	10
Reluctance	6
Test anxiety	5
Family	2
Other teachers	1
TOTAL	39

It is seen that the barriers that prevent children from gaining knowledge are 'school administration', 'physical conditions', 'reluctance', 'exam anxiety', 'family' and 'other teachers'. The opinions of the teacher coded as PT8 are as follows: "Beşiktaş Club sent us a journal this semester and they may have gotten some information from it. I can say that Beşiktaş Club was useful except for my lessons. I mean, there is no improvement in the school administration. I mean they have more important problems. Unfortunately, these people want more academic success, but the scores are not what they want. We are in a strange situation right now." The

fact that the school does not organize various activities, conferences, seminars, etc. for children emerges as the biggest barrier to their knowledge. The teacher coded as PT7 said: "Actually, as I said, children come to school here at certain times. I mean, we open the school in September. It takes until November for the child to enter the school regularly. Since children work as seasonal agricultural workers, children do not come to school anyway. Otherwise, I mean, there are no activities, seminars, etc. to benefit from the benefits of sports, so there is no initiative because they never have such opportunities." In line with their views, the physical environment and facilities of the school are also a major barrier. Children can learn and love by practicing. But as long as there are no opportunities for practice, the information given to children cannot go beyond the theoretical stage. In addition, children's reluctance prevents them from acquiring knowledge. The fact that they use social media only for entertainment purposes and spend most of their time inactive is seen as the beginning of an inactive life for children. In addition to these, the fact that children want to concentrate on their exams due to their future concerns and that their families only think about academic success are among the reasons preventing children from acquiring knowledge.

DISCUSSION AND CONCLUSION

Opportunities for Children in the Process of Acquiring Physical Activity Habits

The aim of this study was to examine the opportunities and barriers in the process of children acquiring physical activity habits from the perspective of physical education and sports teachers. The data obtained for this purpose revealed the potential of physical education classes in the process of children acquiring physical activity habits. In the emergence of this potential, it was understood that the teacher's approach is important and that the teacher is one of the most important factors that motivate children to lessons. In this sense, the findings obtained are similar to the study conducted by Çiçek et al. (2002). In this study, it was concluded that the teacher was the factor that greatly affected children's participation in the lesson (Çiçek, 2002). It was also stated that the more the child likes the teacher and the more prepared the teacher is for the lesson, the higher the child's participation in the lesson (Çiçek et al., 2002). In another study conducted with primary school students, it was concluded that students liked their physical education teachers and behaved in a friendly manner (Aybek, İmamoğlu, & Taşmektepligil, 2011). As a result of the study, teachers' willing and positive behaviors are seen as the most important opportunity for students to acquire physical activity habits.

In line with the teachers' views, SBPA emerged as an opportunity. In their study, Harrison and Narayan (2003) concluded that students who participate in physical activity programs at school and engage in regular physical activity are academically successful in addition to liking school, social communication with peers and communication with teachers. It is seen that SBPA programs are very effective in the process of acquiring physical activity habits and direct students to positive behaviors. In addition, participation in SBPA programs enables children to attend school and develop self-confidence (Trudeau & Shephard, 2008). These results stand out as opportunities to support our study in terms of the multifaceted supportive aspect of SBPA for children.

In line with the opinions of the teachers, it was concluded that the physical competencies of children living in rural areas are good and do not affect their participation in the lesson. In their study, Al- Zandee and Ünlü (2019) found that the factor that determines children's participation in the lesson and their liking for the lesson is their predisposition to the lesson. In the results obtained in parallel with this study, it is the opinion of the teachers that when children's physical competence is low, their participation in lessons is low or they do not want to participate.

Children who consider themselves physically competent will increase their participation in physical activity (Sollerhed et al., 2007), and they concluded that physical competence is a determining factor for children's participation in activity.

In the process of acquiring physical activity, friends and teachers were found to be opportunities in students' relationships with the environment. In addition, in a study in which focus interviews were conducted with a group of students, the circle of friends was revealed as both a barrier and an opportunity for participation in physical activity. In the interviews, it was determined that children moved away from physical activity because they wanted to spend more time with their friends (Whitehead & Biddle, 2008). Contrary to the results of this study, in our study, the circle of friends was seen more as an opportunity for children. This result reveals that the context of social activity with friends can be an opportunity to support physical activity or a barrier in the opposite direction.

The factor that teachers perceived as an opportunity to obtain information was determined as teacher and internet media. In a study in which the motivation to participate in physical activity was determined, it was concluded that students participated in regular physical activity knowing that they were aware of the benefits they would gain as a result of participation in physical activity and that the participation of younger students was higher than that of older students (Eskiler, Küçükibiş, & Gülle, 2016). This shows that the knowledge acquired about physical activity is a supportive factor for lifelong physical activity habits.

Children's Barriers in the Process of Acquiring Physical Activity Habits

Although physical education classes are seen as an opportunity to ensure children's participation in regular physical activity, the insufficient number of class hours and the fact that children cannot meet the physical education teacher in primary school are seen a barriers by teachers. In a study conducted with classroom teachers, classroom teachers were of the opinion that the lessons should be taught by physical education teachers. In the same study, classroom teachers did not see themselves as adequately equipped to teach physical education (Ocak & Tortop, 2006). This situation is similar in the sense that the teaching of physical education and play lessons by classroom teachers at the primary school level is seen as a barrier in the process of lifelong physical activity habits.

According to the opinions of teachers, the barriers affecting children's motivation to acquire physical activity habits are the environment they live in and school facilities. In the study conducted by Yaylacı (2012), students reported that there should be appropriate equipment and facilities in physical education classes. In this study, it is similar to the inadequacy of school facilities expressed by teachers. In a similar study, students stated that school facilities prevented them from doing physical activity. They reported that there were no suitable fields and that the changing rooms in schools were insufficient (Kotan, Hergüner, & Yaman, 2009). Demir and Cicioğlu (2018), in a study examining the motivation to participate in physical activity, concluded that children's motivation is affected by environmental influences and factors such as lack of self-confidence and reluctance are barriers for children. In line with this study, the opinions of teachers that inadequate school facilities and lack of interest of their families reduce children's motivation are in parallel. Inadequate school facilities are seen as an important barrier in the motivation process of children.

When the opinions of the teachers working in the city were examined, it was concluded that the physical competence of the children was quite low for physical education lessons. As a result,

it was revealed that children with poor physical competence were not willing to participate in the lesson and their motivation was affected.

When the opinions of the teachers were analyzed, it was concluded that the environmental factors that prevent children from participating in regular physical activity are the physical environment and the family. Although families think that their children will fall behind in their lessons or fail academically when they participate in physical activities, the academic achievement of students who regularly participate in physical education classes and physical activities is not negatively affected. On the contrary, it is seen that their academic motivation is positive and they have a positive attitude towards their lessons (Akandere, Özyalvaç, & Duman, 2010). Kotan, Hergüner, and Yaman (2009) concluded in their study that families do not provide enough support for their children to do regular physical activity and that children often take a break from sports branches because they do not want their families to get tired. This is similar to the results of this study.

As a result of teachers' opinions, the barriers to children's knowledge about physical activity were found to be school and family. In a study conducted by Allison, Dwyer, and Makin (1999), lack of time, school assignments, other interests, time spent with peers and family were found to be the barriers to physical activity. In the present study, family, school assignments and peers were similar to the findings obtained from teachers, while other interests and lack of time were different. In addition, it was concluded that teachers in rural areas perceived physical facilities as a barrier. In line with the views of the teachers, it was concluded that the common barrier to children's positive attitudes towards regular physical activity is the family. It was concluded that the attitude of their families is reflected on the children and as a result, children are indifferent and lack information. As a result of the opinions of teachers working in rural areas, it was concluded that the physical environment is also a factor that prevents children. In a study conducted by Yaylacı (2012) with primary school students, it was concluded that children did not have enough information about physical education classes in which they participated in course activities and that they perceived them only as entertainment and relaxation. In this study, it was determined that children lacked knowledge about the benefits of physical activity. In this context, the two studies are parallel.

RECOMMENDATIONS

Based on the results of the study, the following recommendations are offered:

- In line with the opinions of physical education teachers, it is understood that when children move from primary school to secondary school, that is, in the 5th grade, when they meet physical education teachers for the first time, they lack the basic skills they need to acquire in terms of physical competence. In this direction, it is recommended that physical education and sports teachers should teach physical education and play classes in primary schools, which have a very important role in the development of lifelong physical activity habits.
- It was concluded that SBPA motivate and socialize children. In line with this result, SBPA programs should be structured and disseminated in schools.
- Inadequate school facilities were found to be an important barrier to implementing SBPA programs and supporting children's lifelong physical activity habits. It is recommended to create a separate fund and increase cooperation to improve the physical conditions of schools where children receive education and to provide adequate equipment support.

- The family factor, which is one of the main barriers to children's participation in regular physical activity, appears for various reasons. Children can regularize physical activity with the guidance and support of their families. At this point, various seminars can be organized for families about the benefits of physical activity and healthy living, and digital content can be created by the Ministry of National Education and the Ministry of Youth and Sports to raise awareness of families.
- In order for children to acquire physical activity habit, they need to have knowledge about some basic issues, especially physical activity and healthy living. In this direction, physical education and sports teachers are recommended to pay more attention to the acquisitions that require cognitive learning and to have a holistic perspective.
- Finally, the results of this study are limited to 23 physical education teachers. The study can be conducted with a wider range of teachers. The study was concluded as a student evaluation from the teacher's perspective. The same study can be conducted by interviewing students.

REFERENCES

Akandere, M., Özyalvaç, N. T., Duman, S. (2010). Ortaöğretim Öğrencilerinin Beden Eğitimi Dersine Yönelik Tutumları ile Akademik Başarı Motivasyonlarının İncelenmesi Konya Anadolu Lisesi Örneği. *Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, (24)*, 1-10. Erişim adresi: https://dergipark.org.tr/en/pub/susbed/issue/61801/924425

Algan, H., Uslu, C. (2009). İlköğretim Okul Bahçelerinin Tasarlanmasına Paydaş Katılımı: Adana Örneği. *Akdeniz Üniversitesi Ziraat Fakültesi Dergisi*, 22(2), 129–140. Erişim adresi: https://dergipark.org.tr/en/pub/akdenizfderg/issue/1571/19458

Allison, K. R., Dwyer, J. J. M. & Susan M. (1999). Perceived barriers to physical activity among high school students. *Preventive Medicine* 28, 608–615.

Al-Zandee, S. S. A., Ünlü, H. (2019). Ortaokul Öğrencilerinin Fiziksel Aktivite Egzersiz Değişim Davranışları ve Beden Eğitimi Dersine Yatkınlıklarının İncelenmesi. *Spormetre Beden Eğitimi ve Spor Bilimleri Dergisi*, *17*(3), 100-118. Erişim adresi: https://dergipark.org.tr/en/pub/spormetre/article/521319

Aybek, A., İmamoğlu, O., Taşmektepligil, M. (2011). Öğrencilerin Beden Eğitimi Dersine ve Ders Dışı Etkinliklere Yönelik Tutumlarının Değerlendirilmesi. *Spor ve Performans Araştırmaları Dergisi*, 2(2), 51-59.

Bulut, S. (2013). Sağlıkta Sosyal Bir Belirleyici; Fiziksel Aktivite. *Turkish Bulletin of Hygiene & Experimental Biology/Türk Hijyen ve Deneysel Biyoloji*, 70(4).

Büyüköztürk, Ş., Kılıç-Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., Demirel, F. (2012). *Bilimsel Araştırma Yöntemleri* (Geliştirilmiş 11. Baskı). Ankara: Pegem Akademi.

Castelli, D. M., Beighle, A. (2007). The physical education teacher as school activity director. *Journal of Physical Education, Recreation & Dance*, 78(5), 25-28.

Cengiz, C., İnce, M. L. (2013). Farklı Okul Ortamlarındaki Çocukların Okul Sonrası Fiziksel Aktivitelerde Algıladıkları Öz-Yeterlilikleri. *Yönetim Bilimleri Dergisi*, 11(21), 135-147. Erişim adresi: https://dergipark.org.tr/en/pub/comuybd/issue/4102/54044

Çiçek, Ş., Koçak, M. S., Kirazcı, S. (2002). Beden Eğitimi Derslerinde Çeşitli Öğretmen ve Öğrenci Davranışlarının Öğrencilerin Derse Katılımındaki Önemi ve Sergileme Sıklığı. *Gazi Üniversitesi. Beden Eğitimi ve Spor Bilimleri Dergisi*, 7(4), 3-14

Demir, G. T., Cicioğlu, H. İ. (2019). Fiziksel Aktiviteye Katilim Motivasyonu ile Dijital Oyun Oynama Motivasyonu Arasındaki İlişkinin İncelenmesi. *Spormetre Beden Eğitimi ve Spor Bilimleri Dergisi*, 17(3), 23-34.

- Dwyer, J. J. M., Allison, K. R., LeMoine, K. N., Adlaf, E. M., Goodman, J., Faulkner, G. E. J., Lysy, D. C. (2006). A provincial study of opportunities for school-based physical activity in secondary schools. *Journal of Adolescent Health 39* (2006) 80–86. Retrieved from https://www.sciencedirect.com/science/article/pii/S1054139X05004635
- Esen, G. (2010). İlköğretim Okulları 2. Kademe Öğrencilerinin Beden Eğitimi Dersi-Ne ve Ders Dışı Spor Etkinliklerine Yönelik Tutumlarında Beden Eğitimi Öğretmenlerinin Rolü. (Yayımlanmamış Yüksek Lisans Tezi). *Marmara Üniversitesi Eğitim Bilimleri Enstitüsü*. İstanbul
- Eskiler, E., Küçükibiş, F., Gülle, M. (2016). Orta Dönem Çocuk Ergenlerde Fiziksel Aktiviteye Yönelik Tutumların Sosyal Pazarlama Bağlamında Değerlendirilmesi, ERPA, *Inernational Congresses on Education*, 716-722.
- Harrison, P. A., Narayan, G. (2003). Differences in behavior, psychological factors, and environmental factors associated with participation in school sports and other activities in adolescence. *Journal of school health*, 73(3), 113-120. doi: 10.1111/j.1746-1561.2003.tb03585.x
- Hu, F., B., Li, T., Y., Colditz, G., A., Willett, W., C., Manson, J., E., (2003). Television watching and other sedentary behaviors in relation to risk of obesity and type 2 diabetes mellitus in women. *J Am Med Assoc* 289, 1785–1791. doi:10.1001/jama.289.14.1785
- Kale, R., Erşen, E. (2010). Beden eğitimi ve spor kültürü. Nobel.
- Koca, C., Hünük, D. (2018). Sports Science Graduate Students'experience With Qualitative Research Learning And Application Process. *Journal of Physical Education & Sports Science/Beden Egitimi ve Spor Bilimleri Dergisi*, 12(2).
- Kotan, Ç., Hergüner, G., Yaman, Ç. (2009). İlköğretim Okullarında Okuyan Sporcu Öğrencilerin Spor Yapmalarında Okul ve Aile Faktörünün Etkisi Sakarya İl Örneği. *Beden Eğitimi ve Spor Bilimleri Dergisi, 3* (1), 49-58
- Makar, E. (2016). Spor Eğitimi Göre Öğrencilerin Sosyal Beceri, Fiziksel Benlik Algısı ve Fiziksel Aktivite Düzeyleri Arasındaki İlişki. (Yayınlanmamış Yüksek Lisans Tezi). Bartın Üniversitesi, Bartın, Türkiye
- Nader, P. R., Bradley, R. H., Houts, R. M., McRitchie, S. L., O'Brien, M. (2008). Moderate-to-vigorous physical activity from ages 9 to 15 years. *Jama*, 300(3), 295-305.
- Naylor, P. J., Nettlefold, L., Race, D., Hoy, C., Ashe, M. C., Higgins, J. W., & McKay, H. A. (2015). Implementation of school based physical activity interventions: a systematic review. *Preventive medicine*, 72, 95-115. Retrieved from https://www.sciencedirect.com/science/article/pii/S0091743514005167
- Ocak, Y., Tortop, Y. (2006). Sınıf Öğretmenlerinin Beden Eğitimi Derlerine İlişkin Genel Görüşleri ve Beden Eğitimi Derslerini Yürütürken Karşılaştıkları Sorunları. 9. *Uluslararası Spor Bilimleri Kongresi*, 3-5.
- Owen, K., B., Parker, P., D., Astell-Burt, T., Lonsdale, C. (2018). Regular physical activity and educational outcomes in youth: A Longitudinal Study. *Journal of Adolescent Health*, 62, 334–340. doi: 10.1016/j.jadohealth.2017.09.014
- Pellicer-Chenoll, M., Garcia-Massó, X., Morales, J., Serra-Añó, P., Solana-Tramunt, M., González, L. M., Toca-Herrera, J. L. (2015). Physical activity, physical fitness and academic achievement in adolescents: a self-organizing maps approach. *Health education research*, *30*(3), 436-448.
- Satman, M. C. (2018). Fiziksel Aktivite: Bilinenin Çok Ötesi. *Spormetre*, 2018,16(4),158-178. Erişim adresi: https://dergipark.org.tr/en/pub/spormetre/issue/40788/456024
- Sollerhed, A., C., Apitzsch, E., Rastam L. & Ejlertsson, G., (2007). Factors associated with young children's self-perceived physical competence and self-reported physical activity. *Health Education Research*. 23-(1), 125-136.
- Subaşı, M., Okumuş, K. (2017). Bir Araştırma Yöntemi Olarak Durum Çalışması. *Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, Haziran 2017 21(2): 419-426. Erişim adresi: https://dergipark.org.tr/en/pub/ataunisosbil/issue/34503/424695

Thomas, E., Bianco, A., Tabacchi, G., Marques da Silva, C., Loureiro, N., Basile, M., Palma, A. (2020). Effects of a physical activity intervention on physical fitness of schoolchildren: the enriched sport activity program. *International journal of environmental research and public health*, 17(5), 1723.

Trudeau, F., Shephard, R. J. (2008). Physical education, school physical activity, school sports and academic performance. *International journal of behavioral nutrition and physical activity*, 5(1), 1-12.

Vural, H., Yılmaz, S. (2016). İyileştirilmiş Fiziksel Çevre Şartlarının İlkokul Öğrencilerinin Gelişimine Etkisinin Öğretmen Gözüyle Değerlendirilmesi. *Bayburt Eğitim Fakültesi Dergisi*, 11(2).

Whitehead, M. (2010). Physical Literacy: Throughout The Lifecourse. Abingdon, Oxford: Routledge.

Whitehead, S., Biddle, S. (2008). Adolescent girls' perceptions of physical activity: A focus group study. *European Physical Education Review*, *14*(2), 243-262. doi: 10.1177%2F1356336X08090708
Willoughby, M. T., Wylie, A. C., Catellier, D. J. (2018), Testing the association between physical activity and executive function skills in early childhood. *Early Childhood Research Quarterly*, 44, 82–89.

Xu, F., Ware, R. S., Tse, L. A., Wang, Z., Hong, X., Song, A., Li J., Wang, Y. (2012). A school-based comprehensive lifestyle intervention among chinese kids against obesity (CLICK-Obesity): rationale, design and methodology of a randomized controlled trial in Nanjing city, China. *BMC Public Health*, *12*(1), 1-8.

Yaylacı, F. B. (2012). İlköğretim Okullarında "Nasıl Bir Beden Eğitimi Dersi İstiyorum?". *Milli Eğitim Dergisi*, 42(195), 194-210.

Yıldırım, A., Şimşek, H. (2013). Sosyal Bilimlerde Nitel Araştırma Yöntemleri. Seçkin yayıncılık.

Yılmaz, U. (2018). Beden Eğitimi ve Sınıf Öğretmenlerinin Beden Eğitimi ve Fiziksel Aktivite Engellerine İlişkin Algılarının Değerlendirilmesi. Akdeniz Üniversitesi (Yüksek Lisans Tezi). Erişim Adresi: https://acikbilim.yok.gov.tr/handle/20.500.12812/30951

Yin, R. K. (2009). Case study research: Design and methods (Vol. 5). Sage

Yuksel, H. S., Şahin, F. N., Maksimovic, N., Drid, P., Bianco, A. (2020). School-based intervention programs for preventing obesity and promoting physical activity and fitness: a systematic review. *International journal of environmental research and public health*, 17(1), 347. doi: 10.3390/ijerph17010347.