Original Article

DOI: 10.14235/bas.galenos.2021.6090
Bezmialem Science 2022;10(6):674-82

Sleep Habits and Quality of Life of Intellectually Disabled Children with and without Regular Physical Activity

Düzenli Fiziksel Aktivite Yapan ve Yapmayan Zihinsel Engelli Çocukların Uyku Alışkanlıkları ve Yaşam Kaliteleri

Emine GÜDEK SEFEROĞLU[1], Ayşe GÜROL[2]

[1]Kütahya Health Science University Faculty of Health Science, Kütahya, Turkey
[2]Erzurum Technical University Faculty of Health Science, Erzurum, Turkey

ABSTRACT

Objective: This study was conducted to determine sleep habits and life qualities of intellectually disabled children who performed or did not perform regular physical activity.

Methods: This descriptive study was done with 126 children between February and June 2017. The data were collected by using the Children's Sleep Habits Questionnaire-Short Form and KIDSCREEN-27. The data were analyzed by using the SPSS package software. The descriptive properties of demographic characteristics are given as percentiles and means. Chi-squared test was used for the comparison of two groups. Independent paired-sample t-test was used to compare intergroup measures. The confidence interval was 95%; $p<0.05$ was considered to be statistically significant.

Results: The children with regular physical activity obtained lower score from Children's Sleep Habits Questionnaire-Short Form. It was found that the children who did not engage regular physical activity, obtained a lower score from KIDSCREEN-27 and its subscales than the children who engaged regular physical activity. The differences between the two groups in terms of general mood and mean scores of your child's feeling, friends, school and learning subscales were also found to be statistically significant ($p<0.05$).

Conclusion: A significant difference in sleep patterns and sleep habits was not found between groups. It was found that intellectually disabled children who engaged regular physical activity had better quality of life.

Keywords: Intellectually disabled child, quality of life, regular physical activity, sleep

ÖZ

Amaç: Bu çalışma, düzenli fiziksel aktivite yapan ve yapmayan hafif düzeydeki zihinsel engelli çocukların uyku alışkanlıklarını ve yaşam kalitelerini belirlemek amacıyla yapılmıştır.

Yöntemler: Bu tanımlayıcı çalışma, 126 çocuk ile Şubat-Haziran 2017 tarihleri arasında gerçekleştirilmiştir. Veriler, Çocuk Uyku Alışkanlıkları Anketi-Kısa Formu ve KIDSCREEN-27 kullanılarak toplanmıştır. Veriler, SPSS paket yazılımı kullanılarak analiz edilmiştir. Demografik özelliklerin tanımlayıcı özellikleri yüzdelik ve ortalama olarak verilmiştir. İki grubun karşılaştırılmasında ki-kare testi kullanıldı. Gruplar arası ölçümleri karşılaştırmak için bağımsız eşleştirilmiş örneklem t testi kullanıldı. Güven aralığı %95 idi; $p<0,05$ istatistiksel olarak anlamlı kabul edildi.

Bulgular: Düzenli fiziksel aktivite yapan çocuklar Çocuk Uyku Alışkanlıkları Anketi-Kısa Formundan daha düşük puan aldı. Düzenli fiziksel aktivite yapmayan çocukların KIDSCREEN-27 ve alt ölçeklerinden düzenli fiziksel aktivite yapanlara göre daha düşük puan aldıkları saptandı. Genel duygulanım ve çocuğunuzun duyguları, arkadaşlar, okul ve öğrenme alt ölçek puan ortalamaları açısından iki grup arasındaki fark istatistiksel olarak anlamlı bulundu ($p<0,05$).

Sonuç: Gruplar arasında uyku düzeni ve uyku alışkanlıkları açısından anlamlı bir fark bulunmadı. Düzenli fiziksel aktivite yapan zihinsel engelli çocukların daha yüksek yaşam kalitesine sahip oldukları saptandı.

Anahtar Sözcükler: Zihinsel engelli çocuk, yaşam kalitesi, düzenli fiziksel aktivite, uyku

Address for Correspondence: Emine GÜDEK SEFEROĞLU, Kütahya Health Science University Faculty of Health Science, Kütahya, Turkey
E-mail: emine.gudekseferoglu@ksbu.edu.tr **ORCID ID:** orcid.org/0000-0001-5803-0059

Received: 24.02.2021
Accepted: 30.11.2021

Cite this article as: Güdek Seferoğlu E, Gürol A. Sleep Habits and Quality of Life of Intellectually Disabled Children with and without Regular Physical Activity. Bezmialem Science 2022;10(6):674-82

Introduction

Intellectual disability (ID) is defined as a limitation in the child's adaptive behaviors and mental functions that begins during the developmental period. Severity levels (mild, moderate, severe, and profound), as defined in the Diagnostic and Statistical Manual on Mental Disorders-V (DSM-V), are based on adaptive functioning in the conceptual, social, and practical domains (1). The definition in DSM-IV utilizes four degrees of severity that reflect the level of intellectual impairment: IQ levels between 50-55 to approximately 70 characterize mild ID, 35-40 to 50-55 characterize moderate ID, 20-25 to 35-40 characterize severe ID, and IQ levels below 20-25 characterize profound ID (2).

Many diseases such as cardiovascular diseases, respiratory system diseases, and gastrointestinal system disorders are more common in people with ID (3). Literature about young people with IDs suggests that adolescents have a greater risk of having chronic diseases compared to adolescents without IDs (4). This systematic literature review shows that the prevalence rates of chronic health conditions in children with IDs are higher than the prevalence rates reported in studies on children without IDs (5). Therefore, people with ID may have higher morbidity and mortality rates and lower quality of life (QoL) (3). The results of the study of Başgül et al. (6) showed that the scores of children with IDs were lower on QoL and also that children with IDs should be supported in all QoL dimensions (physical, social, emotional, and school functioning). Durukan et al. (7) identified that children with IDs had low QoL score in subcategories of emotional well-being, self-esteem, social relationship and school problems. Biggs and Carter (8) observed that people who were aged 13-21 years and suffered from autism or ID had lower scores in subcategories of physical well-being, psychological well-being, social support, and friend than those of children with normal ongoing growth.

Sleep is an important variable of health affecting QoL and well-being. Sundell and Angelhoff (9) reported a significant negative relationship between children's sleep initiation and maintenance problems and health-related QoL in their study on children aged 3-10. Thus, it is important to conduct adequate interventions to eliminate sleep problems. Sleep disorders among children with IDs are very common (10,11). Of intellectually disabled children 34-84% have sleep disorders. Of children with IDs 39% are sleeping together with their mother (12). The children experience problems of being afraid of sleeping in the dark environment, having restlessness in sleep, waking up in the night, having nightmares, speaking, and teeth grinding (bruxism) during sleep (12). Breslin et al. (13) reported in their study that children with Down syndrome were more likely to have a nighttime sleepiness, sleep anxiety, night wake, parasomnia, sleep breathing disorders, and daytime sleep problems.

Based on a comprehensive literature search, the 2018 Physical Activity Guidelines Advisory Committee concluded that physical activity had benefits on brain health including improved cognitive function, reduced anxiety and depression risk, and improved sleep and QoL (14). However, studies on this subject have shown that physical activity rate among children with mental disabilities is low (8,15-17). In the study conducted by Boddy et al. (16) among mentally retarted and 5-15 age group children, it was reported that a very small rate of children (23%) were active enough to benefit their physical health, and they preferred to be alone instead of participating in large groups. Stanish et al. (17) reported that youth with IDs did less moderate and vigorous physical activity than youth with normal development. In the review study investigating physical activity of intellectually disabled individuals in Turkey, Yılmaz et al. (18) reported a total of 55 studies, 42 of which were experimental. They also stated that none of these studies was conducted by nurses. Moreover, these studies investigated the effects of physical activity on motor development, social development and children's activities of daily living and emphasized that there was not enough number of studies on QoL and sleep, and the number of related studies should be increased (18). In conclusion, more research is needed to understand the effect of regular physical activity on sleep and QoL in children with IDs.

Methods

Study Design

This descriptive study was conducted between February and June 2017 in Special Education School and private sports clubs, offering service for children with IDs which were located in the city centers of three neighboring provinces in west Turkey.

Special education school is consisted of both primary and secondary schools. It is an education instution that gives compulsory basic education to children having intelligence scores between 50-55 and 70. All children with mild IDs study in different classes between 1-8.

Private Sport Clubs are organisations which aim to reinforce the social adaptation behaviors of young people with special needs and relations between them and scociety. These Private Sport Clubs conduct volleyball, basketball, football, athletics, table tennis, bowling, gymnastics, and swimmings activities. Children who are members of the sports clubs practice 3 times a week (in different days) for 2 hours. Children with parents come to sports clubs with their own resources. Children do sports with coaches. The studies start with a warm-up period about 5-10 minutes (only running during this time), then continue with sports related movements and finish with a 5-10 minute cooling cycle (stretching and stretching exercises) (19).

Setting and Samples

The population of the study consisted of 94 disabled children enrolled in special education primary/secondary school in the spring semester of 2016-2017 as well as 87 disabled children who engaged regular physical activity program in special sports clubs. In this study, the purpose was to reach the entire universe without using sampling method.

The criteria of inclusion in the study (Group 1):

- Eight to 18 years of age,
- Having mild intellectual disability,

- Having no medical problems, physical disability and/or drug use preventing regular physical activity,
- Not doing regular physical activity.

The criteria for inclusion of the child in the study (Group 2):

- Eight to 18 years of age,
- Having mild intellectual disability,
- Having no medical problems, physical disability and/or drug use preventing regular physical activity,
- Being engaged in any sport activity regularly for at least 6 months in a sports club.

The inclusion criteria of the caregiver:

- Agreeing to participate in study,
- The caregiver should not have psychological, mental issues or any health problem that prevent communication,
- Being a Turkish speaker.

The criteria for exclusion of the child and caregiver in the study: A medical problem that would prevent the child from doing regular physical activity, being physically disabled and/or using medication, the caregiver's mental disability, psychological problems or any health problems that prevent communication, and having caregiver not speaking Turkish. The trainers in private sports clubs were contacted to collect data on frequencies of the children's participation in the sporting activities. Children who were not considered to engage regular physical activity based on the observation by the researchers were not included in the study. Children who did not egage regularly and did not participate in physical activities done 3 times in a week were excluded from the study.

Group 1 consisted of 64 of 94 children who were enrolled in special education primary and secondary school and not engaging in regular physical activity. Goup 2 consisted of 62 of the 87 children who regularly engaged in physical activity in private sports clubs in three neighboring provinces. Children in group 2 were determined according to the World Health Organization (WHO) criteria related to the regular physical activity. According to WHO, children aged between 5-17 years are expected to do medium-intensity physical activity for 60 minutes per day (20).

Data Collection Tools

Children's Sleep Habits Questionnaire (CSHQ)-Short Form and Child Screening Index Short Family Form were used in the study.

Children's Sleep Habits Questionnaire (CSHQ)-Short Form:

This form developed by Owens et al. (21) was used to investigate children's sleep habits and sleep-related problems. The CSHQ includes 33 items. Perdahlı Fiş et al. (22) conducted the Turkish validity and reliability study of the questionnaire. The questionnaire has eleven subscales as morning wake up problems, parasomnias related to sleep interruption, sleep anxiety, sleep disordered breathing, other parasomnias, morning wake up style, sleep duration, transition to sleeping, needing someone to sleep with, daytime sleepiness, and night-wetting (22). Parasomnias, as described in the the International Classification of Sleep Disorders, are "undesirable physical events or experiences" occurring during sleep transition, during arousal from sleep, or within the sleep period (23).

The items in the questionnaire are rated based on the three-point likert scale. The total score of 41 is accepted as the cut-off point and the values above the cut-off point are considered as clinically meaningful. The questionnaire also includes four open-ended questions about the child's sleep habits (bedtime, sleeping duration during the day, stay-awake duration on wake-up at night, morning wake-up time). In their study, Perdahlı Fiş et al. (22) determined the Cronbach alpha coefficient of the questionnaire as 0.78. In this study, the Cronbach alpha coefficient of the scale was 0.82.

Child Screening Index Short Family Form (KIDSCREEN-27):

The validity and reliability of the index in Turkish children/adolescents was confirmed by Baydur et al. (24). KIDSCREEN-27 parent form has a total of 27 items and 5 subscales; physical activity and health (5 items), general mood and your child's feeling (7 items), family and your child's free time (7 items), friends (4 items), and school and learning (4 items). The index is a Likert-type scale. Meral and Fidan (25) examined the psychometric properties of the parent form in Turkish version and Cronbach's alpha value was found as 0.88. In this study, the Cronbach alpha coefficient of KIDSCREEN-27 parents form was 0.86.

Data Collection

In the first stage of data collection, the caregivers of the children, who met the inclusion criteria of the study conducted by the researcher and the related school/sports club managers, received an envelope containing the documents confirming the fact that the school/club management was aware of the study and granted permission. A form explaining the purpose of the study and the permission form indicated whether the caregivers accepted to participate in the study were put into the envelopes. School and sports club managers were asked to send these envolopes to children's families. Envelopes were sent to families by children. Within a week, families were asked to sign the permisison form and send it back to their teachers in school or trainers in sports clubs. The telephone numbers of the families who gave written permission by this way were taken from the managers of the schools and sports clubs. The caregivers were contacted by telephone to check their available time slot. Later, the researcher obtained the contact addresses of caregivers of the children enrolled in the school/sports club. Home visits were made in the specified time slot. The CSHQ and KIDSCREEN-27 were completed during the face-to-face interview made with the families who gave written consent. The forms were filled out by primary caregivers such as parents, fathers, and grandparents.

Data Analysis

The data were analyzed by using the Statistical Package for Social Sciences (SPSS), version 15.0 (SPSS Inc., 2007). Independent paired-sample t-test was used to compare intergroup measures. The confidence interval was 95% and p<0.05 was accepted as statistically significant.

Results

It was determined that 53.13% of the children who did not engage regular physical activity were males, 73.44% were secondary school students, 37.50% were second children and the mean age was 12.90±2.72 years. In the children who engaged regular physical activity, 54.84% were males, 64.52% were secondary school students, 40.32% were the first-born children of the family, and the mean age was 13.70±2.97 years. The two groups were found to be similar (p>0.05).

It was determined that 24.19% of the children who engaged regular physical activity were interested in the athletics branch, half were performing sports activities for 1-2 years, and 64.52% engaged in sports 2 days a week.

It was determined that the CSHQ total mean scores of the children in the group 1 were higher than those in the group 2 and the difference between them was statistically significant (p<0.05). It was found that children in the group 1 obtained higher scores from all subscales of the CSHQ compared to those in the group 2 but the difference between them was not statistically significant (p>0.05) (Table 1).

Nineteen (29.69%) of the children in the group 1 had a score of 41 or less, did not experience any sleep problems at the clinical level, and had a total mean score of 36.57±3.27. Forty-five children (70.31%) had a score of 42 or higher, experienced sleep problems at the clinical level, and had a total mean score of 52.66±10.06. Twenty-seven (43.55%) of the children in the group 2 had a score of 41 or less in the sleep habits questionnaire, did not experience any sleep problems at the clinical level, and had a total mean score of 36.18±2.48. Thirty-five children (56.45%) had a score of 42 or higher, experienced sleep problems at the clinical level, and had a total mean score of 49.28±7.24 (Table 2).

It was found that children in both groups who had sleep problems at the clinical level, had higher scores from CSHQ and the difference between them was statistically significant (p<0.05). The number of children, who had sleep problems at the clinical level with respect to the cut-off point in CSHQ, was higher in both groups and they had higher mean scores from CSHQ. However, it was determined that the difference between the total mean scores was not statistically significant (p>0.05; Table 2).

In this study, the Cronbach's alpha coefficient of the CSHQ was 0.82. The Cronbach's alpha coefficient of the subscales were 0.83 in morning wake-up difficulty subscale, 0.67 in the parasomnias related to sleep interruptions subscale, 0.71 in the sleep anxiety subscale, 0.79 in the sleep disordered breathing subscale, 0.54 in the other parasomnias subscale, 0.34 in morning wake-up style subscale, 0.66 in sleeping duration subscale, 0.40 in transition to sleep subscale, 0.58 in needing someone to sleep with, 0.50 in day-time sleepiness, and -0.035 in the nighttime wetting subscale. Cronbach's alpha coefficients of wake-up style, transition to sleep, daytime sleepiness and night-wetting

Table 1. Children's CSHQ total and subscale mean scores in terms of their regular physical activity status

	Regular physical activity		
	Group 1 Mean ± SD	Group 2 Mean ± SD	Test and significance
Morning wake up problems	6.78±2.91	6.22±2.49	t=1.147 p=0.254
Parasomnias related to sleep interruption	6.14±1.64	6.00±1.68	t=0.474 p=0.636
Sleep anxiety	4.85±2.23	4.85±2.25	t=0.011 p=0.991
Sleep disordered breathing	4.14±1.58	4.03±1.67	t=0.373 p=0.710
Other parasomnias	3.98±1.21	4.22±1.58	t=-0.958 p=0.340
Sleeping duration	3.82±1.38	3.69±1.24	t=0.572 p=0.568
Needing someone to sleep with	2.85±1.25	2.74±1.10	t=0.557 p=0.579
CSHQ total score	47.75±11.28	43.58±8.64	t=2.323 **p<0.05**

t: Independent paired-sample t-test, SD: Standard deviation, CSHQ: Children's Sleep Habits Questionnaire

Table 2. Children's sleep problem at clinical level with respect to the cut-off points of their CSHQ mean scores

Sleep problem at clinical level	Regular physical activity				
	Group 1		Group 2		Test and significance
	n (%)	Mean ± SD	n (%)	Mean ± SD	
Did not have	19 (29.69%)	36.57±3.27	27 (43.55%)	36.18±2.48	x^2=2.610
Had	45 (70.31%)	52.66±10.06	35 (56.45%)	49.28±7.24	p=0.106
Test and significance		t=-9.970 **p=0.000**		t=-9.469 **p=0.000**	

n: Number, x^2: Chi-squared tests, t: Independent paired-sample t-test, SD: Standard deviation, CSHQ: Children's Sleep Habits Questionnaire

subscales were found to be between 0.30 and 0.50, hence, they were not used in the study.

It was found that the hourly mean bedtime of the children in the group 1 was 21.17±4.74, the mean daytime sleep duration was 9.21±1.04, staying awake time at night was 4.37±7.41, and the mean wake-up time was 7.39±0.83. The mean sleep duration of the children in the group 2 was 22.28±0.74, mean daytime sleep duration was 99.05±1.33, mean stay awake time at night was 4.24±6.19 minutes, and the mean wake-up time was 7.34±1.57 hours (Table 3).

In this study, the Cronbach's alpha coefficient of KIDSCREEN-27 parent form was 0.86. The Cronbach's alpha coefficients of the subscales were 0.74 in the physical activity and health subscale, 0.78 in the general mood and your child's feeling subscale, 0.73 in the family and your child's free time subscale, 0.80 in the friends subscale, and 0.73 in the school and learning subscale.

The mean scores of the children in the group 1 for KIDSCREEN-27 and its subscales were 16.45±3.73 in physical activity and health, 24.78±4.38 in general mood and your child's feeling, 26.84±4.04 in family and your child's free time, 14.20±3.65 in friends, and 15.03±3.25 in school and learning. Total mean score of KIDSCREEN-27 was 97.31±12.24. The mean scores of KIDSCREEN-27 in the children in the group 2 for and its subscales were 17.85±3.58 in physical activity and health, 26.98±3.54 in general mood and your child's feeling, 28.75±4.24 in family and your child's free time, 14.85±3.17 in friends, and 16.79±2.25 in school and learning and KIDSCREEN-27 and total mean score was 105.24±11.37 (Table 4).

Comparison of KIDSCREEN-27 and its subscales based on children's the regular physical activity status indicated that the total and subscale mean scores of the children in the group 2, except for the subscale of the friends were higher than the children in the group 1 and the difference between the mean scores was statistically significant (p<0.05, Table 4).

Table 3. Children's sleeping patterns in terms of their physical activity status

	Regular physical activity		
	Group 1 Mean ± SD	Group 2 Mean ± SD	Test and significance
Bedtime	21.17±4.74	22.28±0.74	t=-1.853 p=0.068
Sleeping duration during the day (hour)	9.21±1.04	9.05±1.33	t=0.755 p=0.452
Stay-awake duration on wake-up at night (minute)	4.37±7.41	4.24±6.19	t=0.109 p=0.913
Morning wake-up time	7.39±0.83	7.34±1.57	t=0.226 p=0.822

t: Independent paired-sample t-test, SD: Standard deviation

Table 4. Children's mean scores of KIDSCREEN-27 and its subscales in terms of their physical activity status

	Regular physical activity		
	Group 1 Mean ± SD	Group 2 Mean ± SD	Test and significance
Physical activity and health	16.45±3.73	17.85±3.58	t=-2.148 **p<0.05**
General mood and your child's feeling	24.78±4.38	26.98±3.54	t=-3.098 **p<0.05**
Family and your child's free time	26.84±4.04	28.75±4.24	t=-2.592 **p<0.05**
Friends	14.20±3.65	14.85±3.17	t=-1.067 p=0.288
School and learning	15.03±3.25	16.79±2.25	t=-3.538 **p<0.001**
KIDSCREEN-27 total score	97.31±12.24	105.24±11.37	t=-3.763 **p<0.001**

t: Independent paired-sample t-test, SD: Standard deviation

Discussion

In this study, it was found that the mean CSHQ's scores (47.75±11.28) of children in the group 1 were higher than the children in the group 2 (43.58±8.64). However, the difference between the groups was not statistically significant in terms of the mean scores of CSHQ's subscales. Total mean scores of the two groups were 42 or higher and they had clinically significant sleep problems. In addition, it was noteworthy that more than half of the children who engaged or did not engage regular physical activity had regular sleeping problems at the clinical level per CSHQ cut-off point, but this rate was quite higher among the children who did not. Hence, it might be concluded that regular physical activity decreased the sleep problems in children with IDs. In their study, Wachob and Lorenzi (26) reported that children with autism spectrum disorder aged between 9-16 years had a mean score of 44.4±11.01 and physically more active children had better sleep quality. Köse et al. (11) reported that the mean score was 51.78 in children with ID and 41.56 in children with normal development and sleep disturbances were more frequent in children with ID than children with normal development. The comparative and interventional studies on the relationship between physical activity and sleep have showed that physical activity has a positive effect on sleep (26-30), but there are also studies that do not support this view (10,31,32). In the study performed by Temel et al. (31) with high school students and in the study by Aktaş et al. (29) there was no significant relationship between regular and adequate physical activity and sleep quality. Similar to the results of the present study, in their study, Ghanizadeh and Faghih (10) found that children with IDs did not have more sleep problems in terms of daytime sleepiness, parasomnia, resistance to bedtime, sleep time and sleep anxiety compared to their sibling and healthy children groups. This result of the study suggests that the sleep quality in mentally retarded children is not only related to regular activity, but many factors may be effective in sleep problems.

When comparing the sleeping patterns of the children in the group doing regular physical activity compared to the other group in this study, it was determined that bed-time was later, total sleeping duration was less, time to fall asleep again after wake-up at night was shorter, and the morning wake-up time was earlier. In the present study, it was found that there was no statistically significant difference between children's regular physical activity and sleep patterns ($p>0.05$). Contrary to the findings of this study, Brand et al. (33) determined that children with autism spectrum disorder did aerobic exercise for 60 minutes per week, and at the end of the third week, children's sleep activities increased, their transition to sleep time shortened, and the sleep interruption decreased. In their study, Dodds et al. (34) applied a 5-week physical activity program to children with neurodevelopmental disorder in the age group of 1-14 years and found that children had an increased sleep duration and decreased sleeping problems. When the studies in the literature are reviewed, it is observed that, among children and adolescents with IDs, increasing physical activity improves sleep quality and decreases sleep problems. It is stated that the intervention of a three-week pedometer and daily-based physical activity in adolescents are effective in improving the subjective sleep quality and reduce the frequency of night wake-ups (35) and reduce the time to fall asleep again if sleep is interrupted at night (27). In the current studies (27,34), the authors conducted their studies on children with regularly controlled physical activities over a certain period of time. But, in this study, children engaging regular physical activities in a club were compared with those who did not. The source of difference between our results and current studies' conclusions is based upon this.

In comparison of KIDSCREEN-27 and its subscales according to children's regular physical activity status in the present study; mean scores of all the subscales, except for the subscale of the friends and total mean scores were higher in children in the group 2 than the children in the group 1 and the difference between the mean scores was statistically significant ($p<0.05$, Table 4). In contrast to the results of the study, İlhan et al. (36) conducted a physical education and sports activities program twice a week for 10 weeks to a group of children with IDs aged 8-12 years. At the end of the study, it was reported that the QoL of the children participating in the program was higher than the control group, but the difference between the groups was not significant, and it was suggested that the length of the 10-week program used might be insufficient (36). In the study by Top and Akıl (37), a 10-week swimming practice was found to significantly increase the scores of self-esteem and the QoL subscales of the children with mild IDs in the age group of 12-16 years. The study was conducted with children in the group 2 who were doing regular physical activity for at least 6 months and children in the group 1 who were not doing regular physical activity, and the studies in the literature were conducted with the exercise program over a period of 8-10 weeks. Hence, it can be asserted that the difference between the results of these studies in the literature and the results of the present study was associated with the type and duration of physical activity applied. According to the results of our study, it can be concluded that regular physical activity has an important contribution to the improvement of the QoL of intellectually disabled children.

Bayazıt et al. (38) found in their study that an 8-week athletics program developed motor skills in 11-14 year-old children with educable IDs. In the study by İlhan et al. (39) it was found that regular athletics program increased the self-care skills of intellectually disabled children. The results of the present study supported the literature and it was concluded that physical activity increased the QoL of children with IDs, developed motor skills, and thus had a positive effect on their health.

Vogt et al. (40) reported that 30-min moderate intensity running exercise strengthened emotional state, improved self-esteem, and increased perceived social acceptance in intellectually disabled adolescents. In the study by Çokluk et al. (41) it was observed that the 10-week special physical education program had a positive effect on the self-perception of children with mild IDs. Aslan and Çalışkan (42) stated in their study that participation in exercise and sportive games had a positive effect on anger control in children with IDs. In this study, it was determined

that children with IDs in the group 2 had higher scores in general mood and child's feelings subscales than those in the group 1. The results are compatible with those reported in the literature. According to the results of this study, it can be concluded that participation in sports and exercise is important for the positive psycho-social development of children with IDs.

Grandisson et al. (43) stated that parents were proud of their intellectually disabled children participating in sports and reported an improvement in their family relations. In their study, Blick et al. (3) showed that individuals with IDs who exercised regularly had better participation in society than their peers. Similar to the results in the literature, it was found in the present study that children with IDs who made regular physical activity had higher scores in family and leisure subscale. Therefore, physical activity is thought to be the best quality time for children with IDs to utilize their spare time and spend with their family.

McConkey et al. (44) stated that that sportsmen with/without ID playing together in the same sports team improved their friendship and social participation. Biggs and Carter (8) reported in their study that greater participation by children with IDs in activities outside the school provided a significant increase in the scores of the QoL social support and friends subscales (6). Yarımkaya (45) determined that children with moderate mental retardation between the ages of 11-14 who participated in the peer-mediated adapted physical activity program developed characteristics such as interacting with their peers, acting together with the group, obeying the group rules and sharing, and had positive effects on their socialization levels. Based on this information, in the present study, it was found that the mean score of the children in the group 2 as an out-of-school activity was higher than those in the group 1, but this difference was not statistically significant. It was concluded that this result was due to the fact that children who did not do regular physical activity continued their education on a regular basis and their friendship relations were stronger than those who had no education.

In the study by Saygılı et al. (46), it was found that the students who did regular sports had better personality characteristics and academic achievement than the students who did not do regular sports. In the present study, it was found that the mean scores of the children in the group 2 were higher than those in the group 1 and the difference in the scores of school and learning subscale was statistically significant. The results of the present study are compatible with the literature.

Study Limitations

This descriptive study was conducted comparatively. This was one of its limitations. Another limitation was nonqualitative and nonquantitative examinations of physical activities in which children participated actively. Our results showed that new controlled studies to understand the effects of regular physical activities in special sports club would be necessary.

Conclusion

In this study, the sleep quality and QoL of children who engaged or did not engage regular physical activity were compared. A significant difference in sleep patterns and sleep habits was not found between groups. It was found that intellectually disabled children who engaged regular physical activity had better quality of life. It can be recommended that regular school screening is made to identify sleep habits and sleep problems among children with IDs and counseling and education programs for children and parents/caregivers are provided for the solution of the problem. It can be recommended to evaluate physical activity patterns of intellectually disabled children, to train them and their parents/caregivers on the benefits of physical activity, and to ensure that the children with sleeping disorders participate in regular physical activity programs to improve their quality of life. It can be recommended to establish regular physical activity programs outside of school by providing all opportunities for the participation of children with IDs in the programs.

Ethics

Ethics Committee Approval: Atatürk University Faculty of Health Sciences (date: 15.07.2016/decision no: 2016/07/06).

Informed Consent: Obtained.

Peer-review: Externally peer reviewed.

Authorship Contributions

Surgical and Medical Practices: E.G.S., Concept: E.G.S., A.G., Design: E.G.S., A.G., Data Collection or Processing: E.G.S., Analysis or Interpretation: E.G.S., A.G., Literature Search: E.G.S., A.G., Writing: E.G.S., A.G.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

References

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 5th ed. Arlington, Virginia: American Psychiatric Publishing; 2013.
2. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4th ed., text rev. Washington, D.C.: Author: 2000.
3. Blick RN, Saad AE, Goreczny AJ, Roman KL, Sorensen CH. Effects of declared levels of physical activity on quality of life of individuals with intellectual disabilities. Res Dev Disabil 2015;37:223-9.
4. Oeseburg B, Jansen DE, Dijkstra GJ, Groothoff JW, Reijneveld SA. Prevalence of chronic diseases in adolescents with intellectual disability. Res Dev Disabil 2010;31:698-704.
5. Oeseburg B, Dijkstra GJ, Groothoff JW, Reijneveld SA, Jansen DE. Prevalence of chronic health conditions in children with intellectual disability: a systematic literature review. Intellect Dev Disabil 2011;49:59-85.
6. Başgül ŞS, Üneri ÖŞ, Çakın-Memik N. Parents' perception of the quality of life of children with intellectual disabilities. Turk J Pediatr 2011;53:541-6.

7. Durukan İ, Ceylan MF, Kara K, Erdem M, Akça ÖF, Türkay T. Intellectual retardasyonu olan çocuklarda yaşam kalitesi. Yeni Symposium 2011;49:43-50.
8. Biggs EE, Carter EW. Quality of life for transition-age youth with autism or intellectual disability. J Autism Dev Disord 2016;46:190-204.
9. Sundell AL, Angelhoff C. Sleep and its relation to health-related quality of life in 3–10-year-old children. BMC Public Health 2021;21:1043.
10. Ghanizadeh A, Faghih M. The impact of general medical condition on sleep in children with intellectual retardation. Sleep Breath 2011;15:57-62.
11. Köse S, Yılmaz H, Ocakoğlu FT, Özbaran NB. Sleep problems in children with autism spectrum disorder and intellectual disability without autism spectrum disorder. Sleep Med 2017;40:69-77.
12. Yıldırım Sarı H. Zihinsel yetersizliği olan çocuklarda uyku sorunları. Yeni Tıp Dergisi 2010;27:151-5.
13. Breslin J, Edgin JO, Bootzin RR, Goodwin J, Nadel L. Parental report of sleep problems in Down syndrome. J Intellect Disabil Res 2011;55:1086-91.
14. Piercy K, Troiano RP, Ballard RM, Carlson SA, Fulton J, Galuska DA, et al. The physical activity guidelines for Americans. JAMA 2018;320:2020-8.
15. Robertson J, Emerson E, Baines S, Hatton C. Self-reported participation in sport/exercise among adolescents and young adults with and without mild to moderate intellectual disability. J Phys Act Health 2018;15:247-54.
16. Boddy LM, Downs SJ, Knowles ZR, Fairclough SJ. Physical activity and play behaviours in children and young people with intellectual disabilities: a cross-sectional observational study. School Psychology International 2015;36:154-71.
17. Stanish HI, Curtin C, Must A, Phillips S, Maslin M, Bandini LG. Does physical activity differ between youth with and without intellectual disabilities? Disabil Health J 2019;12:503-8.
18. Yılmaz A, Şentürk U, Demir E. Content Analysis on Application for Physical Activity for People with Intellectual Disabilities. ASAS Journal 2015;3:312-27.
19. Özmert EN. Çocuk ve Ergenlerde Fiziksel Aktivite, T.C. Sağlık Bakanlığı Temel Sağlık Hizmetleri Genel Müdürlüğü, Kuban Matbaacılık ve Yayıncılık, Ankara: 2014. http://beslenme.gov.tr/content/files/basin_materyal/Fiziksel_aktivite_rehberi/1_cocuk_ergenler.pdf. 15.02.2018
20. World Health Organization. Physical activity. 2017 http://www.who.int/mediacentre/factsheets/fs385/en/. 14.08.2017).
21. Owens JA, Spirito A, McGuinn M. The children's sleep habits questionnaire (CSHQ): psychometric properties of a survey instrument for school-aged children. Sleep 2000;23:1043-52.
22. Perdahlı Fiş N, Arman A, Ay P, Topuzoğlu A, Güler A, Gökçe İmren S, Ersu R, Berkem M. The Validity and Reliability of Turkish Version of Children's Sleep Habits Questionnaire. Alpha Psychiatry 2010;11:151-60.
23. American Academy of Sleep Medicine. The International Classification of Sleep Disorders: Diagnostic and Coding Manual, 2nd edn (ICSD-2). Westchester, IL: American Academy of Sleep Medicine: 2005.
24. Baydur H, Ergin D, Gerçeklioğlu G, Eser E. Reliability and validity study of the KIDSCREEN health-related quality of life questionnaire in a Turkish child/adolescent population. Anatolian Journal of Psychiatry 2016;17:496-505.
25. Meral B, Fidan A. The Examination of psychometric properties of KIDSCREEN-short version on children with Autism in Turkey. International Journal on New Trends in Education and Their Implications 2013;4:151-9.
26. Wachob D, Lorenzi DG. Brief report: Influence of physical activity on sleep quality in children with Autism. J Autism Dev Disord 2015;45:2641-6.
27. Brand S, Gerber M, Beck J, Hatzinger M, Pühse U, Holsboer-Trachsler E. Exercising, sleep-EEG patterns, and psychological functioning are related among adolescents. World J Biol Psychiatry 2010;11:129-40.
28. Bülbül S, Kurt G, Ünlü E, Kırlı E. Sleep problems in adolescence and the effective factors. Cocuk Sagligi ve Hastaliklari Derg 2010;53:204-10.
29. Kalak N, Gerber M, Kirov M, Mikoteit T, Yordanova J, Pühse U et al. Daily morning running for 3 weeks ımproved sleep and psychological functioning in healthy adolescents compared with controls. J Adolesc Health 2012;51:615-22.
30. Feng Q, Zhang Q-l, Du Y, Ye Y-l, He. Q-q Associations of physical activity, screen time with depression, anxiety and sleep quality among Chinese college freshmen. PLoS One 2014;9:e100914.
31. Temel F, Hancı P, Kasapoğlu T, Kıla RM, Sarıkaya MS, Özcebe H. The sleep quality of students in a vocational high school in Ankara and the influecing factors. Cocuk Sagligi ve Hastaliklari Derg 2010;53:122-31.
32. Aktaş H, Şaşmaz CT, Kılınçer A, Mert E, Gülbol S, Külekçioğlu D, et al. Study on the factors related to physical activity levels and sleep quality in adults. Mersin Univ Saglık Bilim Derg 2015;8:60-70.
33. Brand S, Jossen S, Holsboer-Trachsler E, Pühse U, Gerber M. Impact of aerobic exercise on sleep and motor skills in children with Autism Spectrum Disorders - a pilot study. Neuropsychiatr Dis Treat 2015;11:1911-20.
34. Dodds CB, Bjornson KF, Sweeney JK, Narayanan UN. The effect of supported physical activity on parental-reported sleep qualities and pain severity in children with medical complexity. J Pediatr Rehabil Med 2016;9:195-206.
35. Baldursdottir B, Taehtinen RE, Sigfusdottir ID, Krettek A, Valdimarsdottir HB. Impact of a physical activity intervention on adolescents' subjective sleep quality: a pilot study. Glob Health Promot 2017;24:14-22.
36. İlhan EL, Kırımoğlu H, Filazoğlu Cokluk G. Zihinsel engelli çocuklarda düzenli olarak yapılan beden eğitimi ve spor aktivitelerinin yaşam kalitesine etkisinin incelenmesi. Nigde University Journal of Physical Education and Sport Sciences 2013;7:1-8.
37. Top E, Akıl M. The Effect of 10-Week Swimming Exercise on Life Qualities of Individuals with Mild Intellectual Disability and Their

Families. Journal of Sports and Performance Researches 2017;8:53-61.

38. Bayazıt B, Meriç B, Aydın M, Seyrek E. The Effect of the Psychomotor Features of the Entertaining Fun Athletics Training Programme on Mentally Retarded Children who can be Trained. SPORMETRE Beden Eğitimi ve Spor Bilimleri Dergisi 2007;4:173-6.
39. İlhan EL, Kırımoğlu H, Tunçel M, Altun M. The Effect Of Special Athletics Training To Self-Care Skills' Level On Mentally Retarded Children. KEFAD 2015;6:145-60.
40. Vogt T, Schneider S, Abeln V, Anneken V, Strüder HK. Exercise, mood and cognitive performance in intellectual disability-A neurophysiological approach. Behav Brain Res 2012;226:473-80.
41. Çokluk GF, Kırımoğlu H, Öz AŞ, İlhan EL. The effects of physical education and sports on the self-concept of the children with mild intellectual disabilities. IntJSCS 2015;3:55-72.
42. Aslan Ş, Çalışkan T. Comparison of Anger Status Between Before and after the Exercise and Sports Game Program in Intellectual Disablity. ATABESBD 2017;19:32-40.
43. Grandisson M, Te´treault S, Freeman AR. Enabling integration in sports for adolescents with intellectual disabilities. J Appl Res Intellect Disabil 2012;25:217-30.
44. McConkey R, Dowling S, Hassan D, Menke S. Promoting social inclusion through unified Sports for youth with intellectual disabilities: a five nation study. J Intellect Disabil Res 2013;10:923-35.
45. Yarımkaya E. The effect of the peer-mediated adapted physical activities on the socialization level of the students with moderate ıntellectual disabilities. Kastamonu Education Journal 2018;26:335-44.
46. Saygılı G, Atay E, Eraslan M, Hekim M. Investigation of the Relationship Between Personality Features and Academic Achievement of Students Doing and Don't Sport Regularly. Kastamonu Eğitim Dergisi 2015;23:161-70.