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Management of Football Academies in Turkey: The Coach Perspective*

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Abstract

The management of football academies is a multifaceted process that involves different influential stakeholders. Coaches, as key stakeholders, contribute significantly to the overall success of a football academy. Recognizing coaches' pivotal role in the developmental journey of young football players, the current study employed the systems approach to explore the management practices of football academies in Turkey, with a particular emphasis on the perspective of coaches. The primary objective was to comprehend the challenges and obstacles confronted by Turkish football academies in terms of management and their implications for the overall efficiency of the academies. Furthermore, the study aimed to delineate the fundamental requirements and necessary services encompassing the input, process, feedback, output, and environmental aspects of the football academy system. Fifteen head coaches of senior teams in the top two divisions in Turkey with previous coaching experience in football academies were interviewed using a semi-structured interview. The results were analysed using qualitative content analysis. The findings indicated that management should prioritise specialised coaching approaches tailored to football academies. Training young football players in academies requires coaches specifically trained for this purpose, as it is a distinct profession from those coaching senior teams. The study proposes a solid recommendation to improve coaching education programs, both in quantity and quality, addressing specific challenges in Turkish football academies. The article ultimately emphasises the importance of adopting a systems theory approach to achieve successful football academy management while accounting for environmental factors to achieve sustainable practices in Turkey's football academies.

Keywords: Head coach, Academy coach, Football academy, Football management

* This study is derived from Gökhan Bozkurt's thesis completed at the University of Porto entitled *"The management of professional football academies in Turkey: The Managers, coaches and players' perspectives*.

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INTRODUCTION

Effective management in a sport organization depends on gaining a clear understanding of the relevant stakeholder's perceptions and preferences (Chelladurai, 2014) since the internal stakeholders' involvement would directly influence the performance of the general management practice in the organizations (Freeman, 2010). Coaches are important internal stakeholders who influence the player development (O'Connor et al., 2018). In this regard, recognizing coaches as influential internal stakeholders in the academy management process, the present study examined the football academy management phenomenon holistically from the coaches' perspectives by adopting a systems theory approach.

As internal stakeholders in the player development schemes, the literature consistently highlights the significant role of coaching and the constructive relationship between the athlete and the coach (Côté et al., 2013; Mesquita et al., 2015). Thus, coaching is seen as a crucial prerequisite for attaining elite performance (Cushion et al, 2012; Nesti & Sulley, 2015) in the talent development process. Indeed, the skills and knowledge of the academy coaches can be critical factors influencing the quality of instruction provided (Côté & Gilbert, 2014) in football academies. Furthermore, coaches are responsible for creating a positive environment that fosters learning and growth within the academies (Amorose & Anderson, 2007).

In light of the evident challenges and difficulties encountered by elite football development (Sunay & Kaya, 2018) and the setbacks in player development (Akkoyun, 2014; Çevik & Onağ, 2019) in Turkey, there is a noticeable shortage of academy-raised players participating in Turkish football (Poli et al., 2016; Şenel & Saygın, 2021; Topkaya, 2015). Therefore, the research, by adopting a systems theory approach, aimed to identify the essential requirements and services within the input (resources, staff and talent selection), process (daily operations and services), feedback (evaluative information and communication), output (player development and achievements), and environmental (external influences) dimensions of the football academies in Turkey, from the perspectives of football coaches, leading to practical proposals that could enhance the management processes of these academies.

At this point, it is important to clarify why the present study focused on senior team coaches rather than the academy coaches. Footall players trained by academy coaches eventually switch to senior team coaches when they join professional teams. These senior team coaches then become the main responsible for evaluating their performance at the elite level. In other words, the destiny of young academy players is determined by the senior team coaches. Several studies also showed that the presence of appropriate coaching personnel, within the senior team, who encourage the adjustment of young newcomers, has a significant impact on the players' progression to the first team and elite football (Roynesdal, 2015). In addition, it should also be noted that real-match experiences in senior teams (Houlihan & Green, 2008; Kaplan, 2016; Stotlar & Wonders, 2006), along with the senior team coach's support to the pro-youth policy of the club (Mills et al., 2014) are highly critical

components of the young players' development process. Moreover, the age at which most athletes reach peak levels of performance in team sports, like football, occurs usually in the mid-to-late twenties (Côté et al., 2012; Haugaasen et al., 2014; Moran & Toner, 2017). In other words, football players generally reach top levels after the academy education years (Helsen et al., 2000), which makes senior team coaches substantially influential on the development of athletes throughout their professional elite careers (Wylleman & Lavallee, 2004). As a result, the perspectives and approaches adopted by senior team coaches towards young players play a crucial role in shaping the outcomes of the academy management process. Their pivotal role within the football system ultimately determines the development and success of the players who are raised by a football academy.

METHOD

Research Model

An exploratory study design was employed, utilizing a qualitative approach to explain the mechanisms and underlying reasons how systems operate in Turkish academies.

Participants

The selection of participants for this study employed purposive sampling, a method focused on choosing individuals whose perspectives or experiences align with the study question (Patton, 2015). The criterion sampling method was utilized to simplify the process, ensuring participants met predetermined criteria. Specifically, we focused on active coaches working in the top division of Turkey (*Süper Lig*) within a senior team during the data collection period. Participants were required to have either a UEFA Pro license or a UEFA-A license. Moreover, coaches were required to have a minimum of one year of academy coaching experience to have familiarity with the subject matter. The final number of 15 was determined by the saturation technique (Moser & Korstjens, 2018). The ages of the coaches varied between 42 to 70 years old and 13 of them were former professional football players. Their education level varied from high school (n = 6) to university degree (n = 9). One of them had a master's degree and one of them had a Ph.D. in sports science.

Data collection tools and process

Data collection was conducted through semi-structured, in-depth interviews using open-ended questions (Veal & Darcy, 2014). An interview guide specifically designed for this study served as a framework, consisting of key questions relevant to the research. The interview format was designed to elicit genuine thoughts, personal feelings (Whiting, 2008), and individual stories (Rabionet, 2011) from the interviewees. During the interviews, the participants were asked questions related to four main themes that was defined in interview design: (a) personal background; (b) the ideal services of the academy; (c) current issues faced by the coaches within the club concerning the academy management; (d) the club's responsibility on the process. An introductory conversation was employed as a warm-up, establishing a comfortable and relaxed

atmosphere. The presentation of the introduction and instructions was detailed to encourage participation. For example, we explicitly communicated that the interview wasn't an examination, and participants were encouraged to share their genuine opinions and experiences. Consistency was maintained by asking all coaches the same set of questions, but flexibility in the order was allowed to align with the conversation's natural flow. At the interview's conclusion, participants were given the chance to complement or clarify any discussed and undiscussed points, ensuring that their final thoughts or insights were heard.

Before the actual data collection, a pilot interview was carried out by the main researcher with a coach. The insights gained from the pilot interview led to several minor adjustments and updates to the interview process. To initiate data collection, potential participants were contacted via phone calls to provide them with detailed information about the study's purpose and nature. Those expressing interest were then scheduled for interviews at times convenient for both parties, taking into consideration the participants' availability. All interviews were conducted in person at the participants' respective clubs, with the primary researcher conversing in the participants' native language. This approach aimed to create a safe and comfortable environment for the respondents, ensuring their ease and well-being throughout the interview process. The participants were explicitly informed about the confidentiality of their answers, ensuring the privacy and protection of their responses. All participants were given the option to opt out of the research or choose not to answer specific questions if they felt uncomfortable. However, it is important to note that none of the participants chose to exercise this option. Instead, they actively and effectively collaborated by providing responses to all the questions posed during the interviews. With their consent, the interviews were recorded using a digital audio recording device. The duration of the interviews varied, ranging from a minimum of 40 minutes to slightly over an hour, allowing for a comprehensive exploration of the research topics.

Ethical Approval

Ethical approval for this study was obtained from “Comissão de Ética da Faculdade de Desporto da Universidade do Porto” with the code CEFADE 16-2024 on 26/04/2024.

Data analysis

Upon completion of the interviews, they were first transcribed verbatim in their native language and then translated into English, ensuring that the transcribed data could be evaluated by an additional researcher. Content analysis was performed to explore the content of the transcribed data. It is generally recommended to have around 15- 20 interviews for meaningful results in content analysis (Moser & Korstjens, 2018) and the research readily met this requirement. The data analysis process involved a combination of inductive and deductive approaches. Inductive analysis was employed to identify new categories that emerged from the collected data (Patton, 2015), while deductive analysis utilized pre-defined categories derived from existing literature (Schreier, 2012). After reviewing the *corpus*, the final categorization process was conducted (Bardin, 2004). In total, seven main categories emerged from the data analysis as: important facilities, player development

issues, coaching issues, management issues, club governance issues, federation issues, sports policy issues. These main categories also divided into specific sub-categories to facilitate the interpretation of analysed data. Manual coding was utilized to assign codes to the data (Lee, 2021), and the coded and color-coded transcripts were shared with the other researcher to ensure reliability. This collaborative approach aimed to enhance trustworthiness in the code checks and minimize interpretive bias (Patton, 2002).

FINDINGS

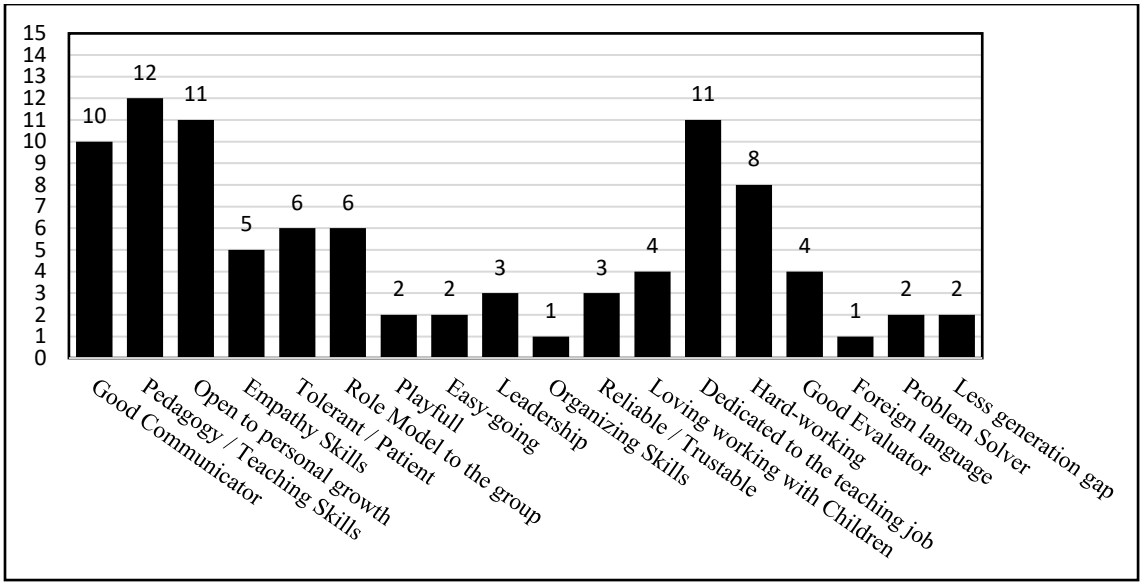
The requisites and services within the input, process, feedback, output, and environmental aspects of a football academy system, as perceived by Turkish football coaches, are presented in Table 1.

Table 1. Domains that affect the overall performance of the football academies

Input Domain	**Process Domain**
Players Coaches Staff Resources	Management Quality Club governance Quality Service Quality
Feedback Domain	**Output Domain**
Communication between the academy and with the A team.	Elite Player
External Domain	
External Influencer + Football Federation + Sport Policy	

Input Domain

Ten of the coaches claimed that talent was a prerequisite for nurturing exceptional players within the academy, as the quality of incoming players would influence their subsequent development in the academy years and hence, they stated that finding the best talent should be the primary aim of football academy management. On the other hand, three coaches expressed concerns regarding the inadequate scouting practices within Turkish academies. Two participants draw attention to the relative age effect in the selection process, noting that players born earlier in the selection year may have an unfair advantage in the current academy system. Additionally, two coaches recommended focusing on targeted regions to enhance scouting outcomes than a nation-wide scouting. Thirteen participants acknowledged that coaching quality directly impacted the quality of player development within football academies. They emphasized the importance of academy coaches possessing specific knowledge and skills that could positively impact the academy management process. These proposed skills that the academy coaches should possess to enhance the development process are shown in Graphic 1 below.



Graph 1. Ideal coaching skills/attributes to enhance academy performance

Still regarding coaching, eleven coaches expressed their concerns regarding the low coaching quality in the academies. For instance, four coaches expressed concerns that the coaches were not proficient in integrating technological software into their training programs. According to coaches, this quality issue primarily stems from the inadequate and insufficient coaching education opportunities provided by the Turkish Football Federation for coaches who wished to work in academies. To enhance coaching quality, the coaches (*n* =11) advised on the implementation of additional educational courses, specifically designed with strong content for those interested in working in academies. Regarding the content, the coaches underlined the need of more pedagogic aspects (*n* =15), expert training science knowledge (*n* =12), child development and physiology knowledge (*n* =8) and communication (*n* =3). A significant majority of the coaches, 14 out of 15, agreed that academy coaching should be treated as a distinct area of expertise separated from senior team coaching. Seven coaches went even further, asserting that academy coaching should be divided and specialized based on specific age groups. Fourteen coaches believed that having a former playing career should not be a prerequisite for becoming a coach in the academies, due to lack of pedagogic knowledge. However, thirteen coaches acknowledged that former playing career could also provide certain advantages in the general development and management process such as empathy, communication and observation skills. For seven participants, the ideal academy coach would be someone who possess both an academic knowledge in coaching and former playing experience. In addition to academy coaching, four coaches also emphasized that the head coach of the senior team plays an even more critical role in the final development phase of academy players.

Besides coaching, eight participants acknowledged that the quality of the other staff members in the academy had a direct impact on the development of players and they emphasized that the quality of the supportive staff in the academy would significantly influence the academy's overall management performance. Thirteen coaches stated that the selection of expert and competent staff

for the academy should be one of the responsibilities of the management team. Moreover, seven coaches remarked on the importance of clubs making longer contractual commitments, on a full-time basis, with expert academy staff to effectively pursue long-term objectives in a more professional environment.

On the other hand, all fifteen participants agreed that there was a lack of competent and expert staff in the academies. Confirming this, thirteen subjects acknowledged the absence of professionalism in Turkish football academies. Four participants conveyed doubts about the lack of academic knowledge among most academy staff, while six coaches observed a lack of pedagogical approach in their work with young players. In addition to pedagogical issues, four coaches raised concerns regarding the academy staff's inability to engage in ongoing professional development. In relation to this, eight coaches stated that there must be constant internal education courses in the academies to equip the staff with the necessary and up-to-date knowledge and skills.

Next to adequate human resources, thirteen coaches underlined the importance of having adequate physical resources for a better developmental process and eleven emphasized that facilities enhanced the effectiveness of coaching and the quality of training in the development process. Similarly, eight coaches stated the physical conditions of the academy were an important success criterion for the academy's overall management performance. In addition, coaches specifically stated that proper academy facilities were a critical component of a successful academy management process (n = 10), positively impacting the motivation and performance of players (n = 5) and providing a competitive advantage over rival academies (n = 7). On the other hand, ten coaches expressed their apprehensions about the lack of proper facilities in Turkish academies and explicitly referred the immediate need for improved infrastructure to support the development process. Still regarding the academy facilities, eight coaches expressed their dissatisfaction with the severe lack of football pitches in the clubs. Relatedly, six subjects emphasized that having adequate and high-quality pitches was essential for effective academy management and it was a sign of respect towards the youth. Furthermore, eleven coaches believed that good pitches were crucial for conducting high-quality training sessions during the academy years and it helps preventing the risk of player injuries.

Concerning the facility's location, eight coaches considered it advantageous to have the academy facilities located on the same site as the senior team. The reasons to advocate same-site provision included: creating inspiration and motivation (n = 8), having role models (n = 2), promoting better relations between the two sides (n = 4), fostering better communication (n = 5), facilitating adaptation to professional football (n = 2), facilitating the transition periods to the A team (n = 3), concentrating on goal-setting (n = 7) and mentorship opportunities (n = 2). Four coaches stated that these benefits could be secured if the same site provision was implemented after a certain age group. In contrast, five participants were against the same site provision because they thought that these two institutions have different agendas, and it could be misleading to youngster who had not become professional footballer yet. Two remained neutral and did not express a preference.

Process domain

Regarding management quality, twelve coaches stated that management's primary task was to provide suitable working environment for the coaches and the players. In relation to this, six coaches stated that the managers should have noticeable problem-solving skills for a smooth-running academy. Additionally, effective communication (n = 2), organizing (n = 4), planning (n = 3), providing necessary internal educations both to staff and players (n = 8) were the other components addressed for an effective academy management. Ten coaches noticed a lack of effective management and organization inside the academies in their clubs. Additionally, thirteen participants raised concerns about the lack of long-term strategic planning with respect to the operations of the academy. According to eight coaches, role confusion was prevalent in the club system concerning the academy due to a lack of clear job descriptions. Four of the coaches stated that clear job descriptions and expectations were the hallmark of improved performance in the academies. Especially, nine coaches stated that the club's governance has never informed them about their expectations for the academy. Six of the coaches underlined the utmost importance of effective coordination between the academy and the club to increase the management quality.

In terms of the controlling function of the academy management, eight coaches emphasized that evaluations concerning the academy's performance should be objective and based on long-term data and measurements, rather than relying on short-term subjective opinions. One coach even proposed that the evaluation of the academies should be conducted by an external expert or a neutral audit company.

Regarding club's corporate governance, the most mentioned problem, refereed by thirteen subjects, was the lack of interest in the academy by the club's governance. Relatedly, twelve coaches proposed that the strategic apex of the club should show more confidence and encouragement for the work of the academy staff. In relation to this problem, seven coaches stated that there is evident lack of investment in the academy by the club's governance. Thirteen coaches raised objections to low salaries in the academies. They believed that clubs should increase the salaries and pay on time to enhance the motivation, dedication and effectiveness of the academy staff. Four coaches also expressed concerns about nepotism within the clubs, particularly regarding the hiring of coaches. Interestingly, five coaches mentioned that the lack of investment in the academies was due to the abundance of money available at the senior level. Thus, as underlined by eight coaches, clubs often prioritized short-term gains and adopted a win-maximizing approach. This pressure to win was identified by thirteen coaches as a barrier that hindered the transition of academy-raised players into the senior team. To address this issue, six of them suggested that the club's governance should adopt an academy-friendly philosophy and mentality. In line with this thinking, ten coaches stressed that the club's mentality towards the academy played a crucial role in the transition of academy players into senior team. As an alternative solution, six coaches suggested that the academies should be more autonomous to operate more effectively and, in line with this, seven coaches declared that football was a professional job, and honorary or voluntary board members of the clubs should not interfere with the professional work of the academy. Ultimately, the club's

governance was seen as the main responsible party for the success or failure of the academies in the current club system, as stated by eleven coaches.

Regarding football development services in academies, three coaches expressed their dissatisfaction with the late start age for organized football in Turkey. Additionally, seven coaches emphasized the lack of physical development of academy players to cope with the physical demands of professional football at the highest level. Six coaches highlighted the noticeable absence of fitness training in the academies. Consequently, they expressed concerns about the academy-raised players' lack of dynamism and tempo, which are crucial for competing at an elite level. The coaches also pointed out that the overall training programs in the academies lack challenging and developmental elements. Specifically, five coaches emphasized the insufficient provision of individualized training tailored to the specific needs of each player. Furthermore, seven coaches emphasized the necessity of integrating psychological and mental preparations into the academy training programs. The coaches also mentioned the absence of a nationwide defined curriculum and teaching program within the academies, leaving the training solely reliant on the abilities and preferences of the clubs' coaches. In terms of the well-being of the young players before, during and after the trainings, eight coaches underlined the importance of proper nutrition, but this component was often missing in most academies. Additionally, three coaches expressed concerns about the lack of safe and hassle-free transportation services for young players, which also negatively affected the resting times and the management of trainings sessions.

Most of the coaches, 13 out of the 15, emphasized the significant role of playing real matches in the player development process. Among them, eight coaches believed that competitive league matches should serve as the final development and evaluation phase for an academy player. Hence, providing players with competitive match experiences was considered as an important service of an ideal football academy. Similarly, playing games was also seen as an essential part of adapting to professional football. Four coaches emphasized that playing contributed to improving game intelligence, while three stated that it played a vital role in building self-confidence on the pitch. The coaches underlined that regardless of what was taught in training sessions, tactical knowledge was truly acquired through game experience. Additionally, it was needed for the development of competitiveness and the enhancement of goal-setting skills. Finally, coaches highlighted that playing matches helped in the mental preparation of players for the upcoming challenges of senior football. Therefore, they stressed the importance of including more competitive matches in the player development program to foster tactical maturity. Two coaches presented an innovative idea, suggesting that academy football should be structured in a manner where youth teams participate in a minimum of two official games per week.

Concerning the transition from the academy to the senior team, while five coaches proposed that objective data and measurements should be utilized to make these important decisions, most of the coaches (n = 11) confessed that this transition was often conducted subjectively by the head coaches of the senior team. Ideally, eight coaches expressed that the transition process should be

planned and organized by the sports director of the club, while five coaches suggested it should be the responsibility of the academy director. Regardless of the specific approach, nine coaches emphasized the need for a well-prepared transition period with established institutional rules. Thirteen coaches stated that without established institutional regulations in force in the clubs, they would be reluctant to utilize young players in league games due to winning pressure on them. It was also highlighted that transition process should be conducted patiently, gradually, and with a pre-defined conscious approach. Six coaches also proposed the implementation of specially designed mentorship and mental support sessions for academy players during their transition to the professional level. Seven coaches strongly emphasized that sports psychology sessions should be included in the academy training program since it has an influence on player's holistic development. Five coaches acknowledged that mental skills play a pivotal role in differentiating exceptional players from average ones throughout their elite careers. However, it is noteworthy that the coaches acknowledged the prevailing neglect of the mental aspect of player development within Turkish academies.

Two coaches favoured the establishment of a career management department inside the academy structure to facilitate the transition process. One coach even suggested the introduction of a transition coach to facilitate this process. A loan-out department that constantly seeks playing opportunities for the players in the market was identified as another valuable service. Other two stated that career development was the responsibility of the academy management and proposed the inclusion of a career consultation service department to the players.

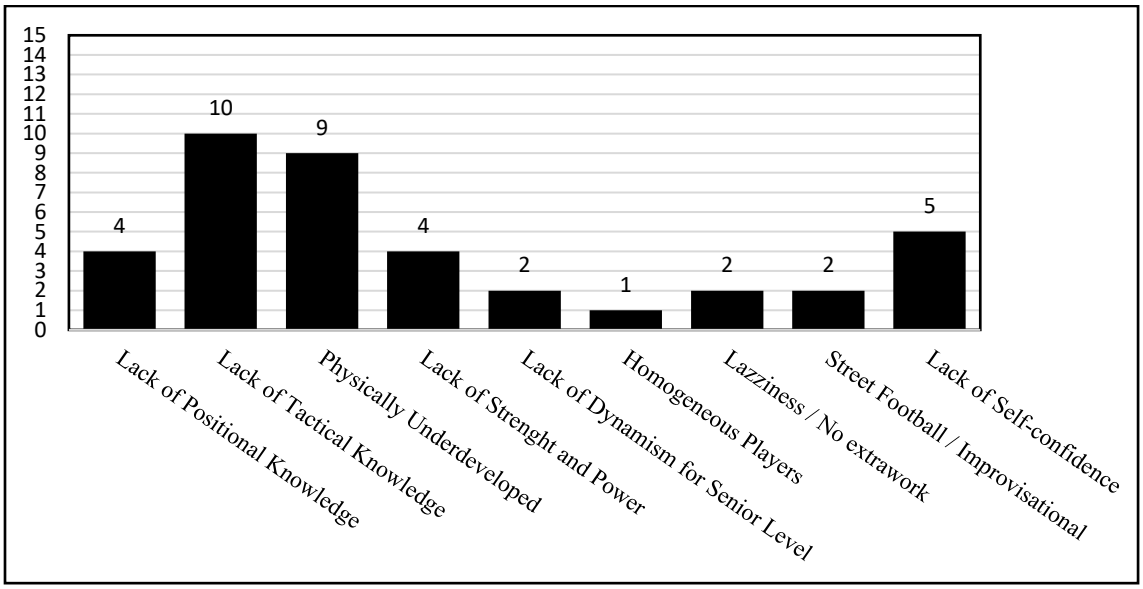
Feedback domain

Three coaches underlined the importance of creating a sense of meaningfulness and belonging inside the club for both the employees and the players. Five coaches believed that financial incentives, such as premium payments on the successful performance of academy, were important motivators that should be provided by the management to the academy staff. The coaches stated that the level of cooperation between the academy and the senior team is crucial for the ultimate success of the academy management. Eleven coaches also underlined the utmost importance of information flow and feedback sharing between the academy and the senior team. Participants viewed the academy and senior team as equally important components of the club system and emphasized the need for well-planned institutional communication and support from the club's management. Otherwise, if there is not any institutional communication policy in the club, this task was left to senior coach's preference and the communication gaps occurred often, as stated by five coaches.

Output domain

According to ten coaches, the main objective of a football academy within a club system should be the development of elite football players physically, technically, tactically and mentally for the senior A team. Moreover, eight coaches referred to a shift in modern football towards the need for versatile players who possess multiple skills. These skills include positional knowledge, game

intelligence, anticipation skills, being a team player, speed and ball-control skills. On the other hand, the coaches also addressed certain issues commonly observed among young players transitioning from Turkish academies to senior teams. The biggest issues are found to be shortcomings in physical development and lack of tactical and positional knowledge. The complete list of most noticed problems among the academy-raised Turkish players are presented in Graphic 2.



Graph 2. Noticed problems among academy-raised players in senior teams

Additionally, the coaches expressed several soft skills they expected from academy-raised players for elite level senior football. Most desired skills were self-confidence (*n* = 7), intelligence (*n* = 9), self-regulation (*n* = 10), work discipline (*n* = 9), intrinsic motivation to play (*n* = 5), dedication to job (*n* = 7), being open to continuous development (*n* = 7), taking responsibility (*n* = 5), cognitive-perceptual skills (*n* = 6), communication skills (*n* = 3), adaptation skills (*n* = 5), resilience (*n* = 3), fair-play and ethics (*n* = 2).

Environment Domain

Various factors were identified as influential in the management of the player development process, including parents, friends, agents, fans, media, girlfriends, other players, and school teachers. Among all, the parents of the player were the most critical factor that may affect the development process (*n* = 12). Hence, coaches proposed an innovative idea and strongly emphasized the inevitable necessity of organizing formal education sessions for the parents of the academy players. Additionally, four coaches remarked that fans could have a negative impact on young players, due to unrealistic expectations, particularly during the transition period from academy to the senior team, therefore the management must protect the young players from the fans and the media if necessary.

Twelve coaches expressed that there are problems caused by football federation in Turkey, which significantly affected the performance of academy management. Eight coaches stated that there was not any defined, nationwide football development system or scientifically approved curriculum to follow in the country and thus the training methodologies are left to individuals' preferences. Six coaches also underlined the insufficient coaching education programs offered by the federation. According to them most of the '*training for trainers'* programs do not go beyond just issuing certificates. Other significant drawbacks were identified as nepotism and political influence in federation's committees and bodies (n = 3), lack of competitive league structures for youth (n = 4), and lack of strict supervision and inspection on clubs concerning the youth policies (n = 6). Accordingly, the participants underlined the importance of organizing better and more educational courses (n = 7), having a solid national youth policy and strategy (n = 7), providing incentives for academy-friendly clubs (n = 4) and exercising coercive power and better controlling on clubs (n = 6).

In terms of sports policy, main issues were related to schooling problem of elite athletes and low quality of national education (n = 7), which in return, affected professionalism levels of Turkish players and coaches and their communication skills with international football world. Moreover, four participants underlined the lack of public investment in grassroot football activities. Four participants also expressed concerns that public universities lack practical solutions relevant to the football industry. Consequently, they recommended that the government redesign university degree programs to address the practical needs of the sector.

DISCUSSION

Input Domain

The coaches emphasized that academy management should primarily ensure that talent enters the academy system in terms of players, coaches, manager and staff. Regarding the player input, the current approach on the selection of incoming players relies on physical attributes, making it susceptible to the relative age effect trap. Alternative methods such as bio-banding (Cumming et al., 2017) for more fair observations at trial-games or longer-term observation based on data may be implemented in the selection process. The results also showed that personal attributes and soft skills were often disregarded in Turkish academies, leading to detrimental effects on the development process and outcomes in the later stages. This means that football academies need to launch more rigorous scouting departments exclusively for the needs of the academy (Sarmento et al., 2018). Results also suggested that more focused approaches, targeted at specific regions may yield better results in detection and identification.

The coaches assigned considerable importance to the competence and quality of the academy manager, recognizing his direct influence on the overall management process. This acknowledgement stems from the belief that effective sports management can only be delivered

through the expertise of experienced managerial staff in their respective field (Erdal, 2017). In other words, the manager's quality and competence played a crucial role in shaping the outcomes of the academy and success of the coaches in Turkey.

Apart from the player and manager input, the quality of trainings provided in the academies directly depended on the abilities and expertise of the coaches (Farrow et al., 2013). According to several authors, access to quality coaching has a great effect on athlete's success (Lapiano & Zotos, 2023) and thus it impacts the performance of academy management. A lack of development-specific expert coaching is identified as one of the significant barriers in youth player transition to professional first-team football (McGuigan et al., 2023). Because of this, especially at developmental years, coaches are expected to be qualified, knowledgeable and specialist (Coutinho et al., 2021). In this context, a pedagogical approach and effective communication skills with young players were identified as valuable in academy coaching. It's evident that having specific training knowledge tailored to specific age groups and contexts is a pre-requisite for ideal coaching in the player development process (Armour, 2013; Côté et al., 2013). Therefore, as results suggested, coaching young players in a football academy requires specialized knowledge and expertise due to the specific age and developmental stages of the athletes involved. Consequently, academy coaching should be distinct from senior football coaching, as their areas of focus differ significantly. Academy coaches should specialize in youth coaching on specific age-groups, because it is necessary to have expert coaches who possess the domain-specific knowledge to foster improvement, particularly as athletes advances in elite level (Baker et al., 2003).

In this regard, we originally suggest that the term "academy coaching" should be redefined as "age-group specific academy coaching", aligned with the targeted age groups of the academy. Instead of a general academy coach, academies should even go further and hire licensed expert coaches for each specific age groups. Football has become a sport where expertise is sought after (Haugaasen et al., 2014). For instance, the knowledge and ability required for an U12 coach would differ significantly from those needed for a U18 coach. Similarly, coaching U19 players would also demand different skills and attributes compared to working with U10 teams. Therefore, providing a specialized education to coaches is important because what may be appropriate for some players may be excessive for others (New & Gill, 2010). This specialization can also be extended to fitness coaches who aspire to work in a football academy, as movement development varies across different age groups and, apparently, bone and muscle growth are different at different ages (Gallahue et al., 2012). The physical needs of a 12-year-old player, for example, differ significantly from those of 19-year-old adult athletes. Expertise in this area is crucial to prevent injuries and stress-related fractures caused by inappropriate training volume and intensity (New & Gill, 2010). Therefore, the academy management must consider these attributes when selecting coaches and staff for the academy. In addition, it is worth highlighting that even though a former playing career may offer certain advantages in coaching, it does not make a significant difference, especially for very young age groups. In fact, it may even be detrimental if the former player lacks pedagogical knowledge and approach. Ideally, an academy coach selected by the academy management should

possess a combination of theoretical and practical lessons in youth development and be able to teach skills within academies (Topkaya, 2015).

To bring more job dedication and professionalism to academy coaches, it's wise to have financial incentives and longer contractual commitments with academy staff including the coaches. Currently, due to unfavourable conditions, academy coaching is often seen as a means to advance to senior team positions, rather than being considered a primary profession (Sunay & Kaya, 2018; Topkaya, 2013). The presence of this kind of organizational injustice inside the club contributes to a lack of commitment and satisfaction (Mohammadi et al., 2016) among individuals working in football academies. As a result, in Turkey, most clubs employ academy coaches on an annual basis and as part-time jobs. This causes a lack of job security, and it impedes coaches from fully dedicating themselves to their roles and institutions, as they remain uncertain about their employment status for the following season. In this context, coach commitment is highlighted as an important factor to create positive athlete-coach relationship (Reverberi et al., 2020) which ultimately determines the quality of the trainings and outcome of the academy. Regarding professionalism problem, some coaches also raised concerns about nepotism within the club's governance, whereby individuals with personal connections were appointed to important academy coaching positions. This is an important issue that requires a contemplating. Because, if the salaries and financial benefits of academy coaches and staff increase without implementing any quality standards and academic requirements, it could potentially create more nepotism problem within the clubs. In other words, simply raising salaries is not an efficient solution, but on the contrary, it would lead to increased nepotism and decreased coaching quality within the academies. Therefore, before considering salary increases, it is crucial to establish transparent and fair recruitment processes within the academies that prioritize merit and academic qualifications. This would ensure that coaching positions are filled based on deserving candidates rather than personal connections.

These findings suggest that there is potential for a strong relationship between the university and the football sector in Turkey. Universities can provide customized programs for former football players who aspire to work as coaches in academies. It may be unrealistic to expect a 35-year-old newly retired player to enrol in a four-year bachelor's degree program in a sports faculty to obtain an academic degree diploma, however, a specially designed academic training program in a university, supervised by professors, and spanning one full academic year, could be an effective solution to equip these experienced but less informed former players with the necessary academic and pedagogical knowledge. To facilitate this process, the Turkish Football Federation could introduce a new regulation requiring a one-year university academic course, as explained above, as a prerequisite for working in football academies. Along with this one-year academic course, the federation could focus on implementing age-specific education courses for the final licensing purposes. In other words, universities could play an active role in providing fundamental scientific education to aspiring coaches, while the federation can concentrate on offering specialized age-specific courses for internal licensing. During this one-year academic coaching course, former players can simultaneously do the internship in the academies. This approach would transform

football academies into structured, controlled, and academically informed internship platforms for newly retired footballers and improve the quality of the workforce in Turkish football.

The present study also revealed that coaches perceived football academies as informal training grounds to develop their coaching skills after their football career. According to Cushion and Jones (2006), coaches' practices often reflect past habits and unconscious processes. To address this issue, clubs should provide extensive and compulsory internal education programs that equip coaches with relevant and up-to-date skills and knowledge (Nesti & Sulley, 2015). This would help them overcome unwanted old habits from their playing years in their coaching careers. In addition to coaching knowledge, coaches need be passionate about self-improvement to keep up with the latest developments in the sector. The upcoming academy players belong to Generation Z or even Generation Alpha, having grown up with the internet and iPads at their fingertips. Therefore, relying on outdated statements such as ‘‘It wasn't like this during my playing days’’ is no longer a valid argument for these new generations. New generation of footballers seek data, measurements, and facts to support the coaches' decisions and the staff's actions. They can easily access different training drills on YouTube, explore the facilities of other academies, and connect with footballers from all around the world online. As a result, coaches, and the academy staff, must be prepared to meet the needs of this new generation. In today's football world, the academies require more than just experienced coaches; they require what we originally refer to as ‘‘updated-experienced coaches and staff.’’ Merely having a playing or coaching background is no longer sufficient to effectively develop the next generation of players.

In terms of resources, the coaches emphasized that having modern and suitable facilities and training conditions is essential for the success of coaches. Access to competitive facilities has a great effect on athlete success (Lapiano & Zotos, 2023), contributing to create a positive motivational climate for both players and staff to develop (Moran & Toner, 2017). Contrariwise, lack of accessible sport facilities can be an important institutional barrier to sports participation and athlete development (Hylton, 2013) and most coaches on this study expressed dissatisfaction with the inadequate number of pitches available in their club's academies. This shortage was seen by the participants as a sign of disrespect and negligence towards youth football, which is consistent with the idea that working conditions that fall below acceptable standards can demotivate staff members in the workplace (McGrath & Bates, 2017) and eventually impact the psychological contract between coaches and players within the club. Additionally, it should be noted that one of the important factors determining the quality of learning and development is the motivation of the players (Sivrikaya, 2018). When coaches and players witness the club’s negligence towards the academy, their motivation and dedication levels decrease, and this has a negative influence on the overall performance of academy management. Therefore, in addition to having an adequate number of pitches, ensuring access to high-quality training facilities and resources is essential for the comprehensive development of players in football academies (Larsen et al., 2020). The coaches also expressed that it could be advantageous to have academy facilities located on the same site or near the senior team. However, this arrangement was primarily beneficial for higher age groups.

Therefore, it would be recommended that the oldest age group in the academy, which in the Turkish football system is U19, should share facilities with the senior team to take advantage of the associated benefits. Apparently, there is no point of putting U12 team next to senior team training facilities.

Process Domain

The results showed that the trainings conducted in academies lacked challenging and formative aspects. To address this issue, it is crucial to organize academy trainings in more challenging ways that incorporate more formative aspects, enabling players to learn new skills (Mills et al., 2014). Because the importance of quality over quantity in practice is more influential in the development of expert-level skills (Ericsson, 2003). However, currently in traditional training approaches, the players are trained just to be prepared for the next academy game, and individualized sessions are often overlooked in Turkish academies. Therefore, academies must implement individual assessments of the players in the beginning of the season (Beswick, 2016), to identify the specific needs of each player and design customized training programs to facilitate their individual development. In this regard, Turkish academies currently lack visual classroom instructions, theoretical guidance, and individualized training and tailored sessions for each player. Incorporating visual feedback, such as having players review their performances, should be prioritized in academies (Abrahams, 2012).

Furthermore, to enhance the effectiveness of training sessions, the coaches advised that academy football should be organized in a manner where young players, after reaching a certain age group, participate in two games per week. Zibung and Conzelmann (2013) suggested that football requires large quantities of football-specific learning activities and game experiences during childhood to achieve high footballing performance levels at the ages of peak performance. Moreover, hours accumulated in football specific plays and practice during childhood and youth is a strong predictor for perceptual-cognitive expertise in football game (Roca et al., 2012). This insight holds significant implications for the future development of Turkish players, as it is commonly observed that Turkish teams and players struggle to adapt to the demands of two games per week during European club competitions, resulting in a notable decline in performance. This issue is closely linked to Turkish players' lower sporting age compared to their European counterparts, due to the late starting ages for organized football training and matches. Consequently, training ages of young Turkish players are affected negatively, and this issue needs to be addressed by increasing the numbers of annual competitive matches.

In terms of progression to professional football, providing smooth transition paths is considered one of the significant roles of academy management (Relvas et al., 2010). Hence, the academy management should strategically design and implement measures to facilitate a smooth transition from the academy to the highest level of professional football (Gulbin & Weissensteiner, 2013). Effective communication among all relevant parties is vital in successfully navigating the transition process (Mannix et al., 2023). Because of this, transitions should be based on clear and established

institutional rules rather than relying on subjective decisions by head coaches of the senior teams. Because the first-team coaches are evaluated on short-term results and thus their short-term inspired evaluation process on young players blocks long-term thinking and reduces the opportunities for academy players (Balliauw et al., 2022). Chelladurai (2014) confirms that explicit rules and procedures are essential for any effective sports organization to guide and regulate staff behaviour. These important decisions should not be left to mere chance or dependent on the subjective decisions of coaches or staff (McCalman et al., 2023) who are in positions of power at the club during that period. In other words, decisions regarding academy-raised players should be explicit and aligned with the institutional strategy of the clubs on youth players. Hence, the management of the club is responsible for the protection of the club's important assets, including the academy-raised players. Additionally, during youth-to-senior transition period, players must be also provided with the effective mental support (Mitchell et al., 2020) by the clubs, but the reality in Turkey is that the assigned sports psychologists in academies are often too young, inexperienced interns or part-time professionals from outside the football world. Sport psychologists need to move from academic conversations to meaningful interventions (Abrams, 2012). Therefore, even though the service is given in some Turkish academies, the efficacy of this service is highly questionable. Considering that the coaches spend a significant amount of time with the players and have a deeper understanding of their realities, it is also highly recommended that academy coaches be equipped with the fundamentals of sports psychology as well. This concept should also guide future education programs designed for coaches by the Turkish Football Federation.

Concerning progression to professional level, the competence and quality of the head coaches of the A teams play a decisive role as well in the holistic development process of the young players, especially during their transition periods, significantly influencing their future success at the elite level (Coyle, 2009). The coaches in the A team bear a responsibility for the final stage of the development phase of academy-raised player, but in most of the cases, the indispensable role of the A team is overlooked in the academy's development process in Turkish clubs. To become professional footballers, academy players must compete in professional leagues within professional football teams. It is unrealistic to expect young players to develop the mindset and skills of professional footballers while they are exclusively participating in amateur or youth football. The literature further supports the notion that engaging in competition is highly developmental (North et al., 2014), provided it is appropriately managed (Côté et al., 2013). Involvement in A team football is therefore crucial for players to attain tactical and mental maturity, improve game intelligence, boost confidence (Höner et al., 2021) and cultivate a competitive edge. Our study suggested that the A team is, in fact, an integral part of the academy development chain and it is equally responsible, alongside the academy, for the development of players in a club system.

Feedback domain

From a systemic perspective, the lack of communication between the academy and the A team poses a severe problem that can disrupt the chain of the academy management process. Because the consequences of poor communication between academy and the professional team may lead to

misunderstandings among players, coaches and staff (Larsen et al., 2013). In this regard, it's important that clubs must deliberately design their player development policies (Sweeney et al., 2021) and establish comprehensive and direct communication channels for the implementation of youth policies.

Output domain

The results showed that coaches preferred having more complete and versatile players who excel in multiple aspects of the game, as successful outcome of the academies. In addition to technical, tactical and positional knowledge, game-intelligence, anticipation skills, being a team-player, perceptual-cognitive skills are considered as important factors for the development of elite football players in the academies (Machado et al., 2023). The players who are faster (Höner & Votteler, 2016), better at ball control, physically developed and who have self-confidence, commitment and mental toughness (Höner & Feichtinger, 2016) are expected from a football academy; therefore, management can adapt training plans to incorporate these concepts.

Environment domain

The parents of the players emerged as the most influential external factor in the player's development. To mitigate any potential negative impact they might have, it is beneficial that academies organize educational sessions for the parents as well. The player and his parents embark on a very long journey together to be an elite professional footballer, but it is only the player who gets the necessary education in this demanding process. Hence, the parents should also receive relevant mentorship and preparation to navigate the challenges that come with being the parent of a professional footballer.

In terms of the federation's task to improve academy management in Turkey, the present study has highlighted the issue of coaching quality and lack of coaching expertise in Turkey. This is attributed to the lack of sufficient and adequate coaching education available to those who aspire to work in academies as a career choice. The Turkish Football Federation (TFF) is responsible for addressing this matter by organizing relevant education programs aimed at increasing coaching quality and ensuring standardization in coaching and teaching. To address the problem of low coaching quality, the TFF must increase the number of coaching education events. In addition to quantity of these events, the quality of those education events must also be increased. For this aim, the competence and quality of trainers working in the federation's education department should be scrutinized, as they play a crucial role in tuning the quality and effectiveness of those practical education courses. Therefore, the TFF should prioritize the employment of the best educators and experienced expert coaches in Turkey for its education department. In this matter, sports faculties in Turkey and the distinguished academicians should be consulted and employed more often in the TFF trainings. Another immediate task for the federation appears to be the establishment of a clearly defined national curriculum and teaching program, developed under the guidance of academic experts. Lack of access to scientifically developed training programs can be an important institutional

barrier to successful athlete development. This initiative would not only focus on the number of training sessions but also emphasize the type, time and content of training provided in academies.

In the context of educational matters, apart from the issues with TFF's educational programs, there appears to be a broader national education problem. The national quality of education may be an external factor that indirectly affects talent growth and development as a whole (Xiang et al., 2023). For instance, low level of English-speaking skills is not limited to Turkish coaches or players; this issue extends to graduates across various disciplines in Turkey and consequently our workforce in sports naturally remains local, thus, they are unable to utilize international opportunities. Similarly, work ethic, discipline, and intellectual development are not solely shaped within football academies but are also significantly influenced by the national education system. The responsibility for enhancing the nation's education lies with the relevant ministry, therefore, some influential environmental factors effecting player development quality in Turkey are beyond the control of the football academies.

CONCLUSION

Even though coaches are pivotal figures in player development in the academies, their capacities intrinsically tied to managerial decisions, ultimately, it highly depends on the approaches of club's corporate governance. The selection and appointment of coaches, as well as the support and resources provided to them by the club executives, are crucial determinants of their effectiveness and directly impact on player development in the academy. Managerial decisions related to hiring, training, and retaining the coaches eventually influence the level of expertise and developmental approaches within football academies. In summary, it was found that specialized coaching approaches tailored specifically to the age-groups within football academies, employment of expert youth coaches and more challenging and formative training programs in the academy training schemes would enhance the effectiveness of academy management. Moreover, the academies are also highly influenced by the sports environment in the country, which is shaped by the football federation's capacity and capability, as well as the sports policy and culture in the country.

SUGGESTIONS

In addition to the practical suggestions outlined in the discussion section, the study also identifies the domains that influence the overall performance of football academies in Turkey from the perspective of coaches who are currently working in the sector. This domain map may serve as a foundational framework for outlining the essential services and minimum requirements necessary for the effective operational management of football academies in Turkish football system. As evidenced by the findings, the success of an academy is not solely dependent on youth training but rather on the effective management and organization of training programs. Therefore, a broader systems approach should be adopted.

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REFERENCES

Abrahams, D. (2012). *Soccer tough: Simple football psychology techniques to improve your game*. Bennion Keary Limited Publishing.

Abrams, M. (2012). *Anger management in sport: Understanding and controlling violence athletes.* Human Kinetics.

Akkoyun, S. (2014). *Türkiye'deki futbol kulüplerinin alt yapılarının yapılanması: Yönetim Biçimleri, idari yapısı ve Avrupa'daki örneklerle kıyaslanması*. Yüksek Lisans Tezi: İstanbul Kültür Üniversitesi, Sosyal Bilimler Enstitüsü.

Amorose, A. P., & Anderson, M. B. (2007). The influence of the coach on athlete development. In D. Gould, J. R. Williams, & H. A. Ford (Eds.), *Advances in sport psychology* (4th ed)., pp. 335-364). Human Kinetics

Armour, K. (2013). *Sport Pedagogy: An introduction for teaching and coaching*. Routledge

Baker, J., Horton, S., Robertson-Wilson, J., & Wall, M. (2003). Nurturing sport expertise: Factors influencing the development of elite athlete. *Journal of Sports Science and Medicine 2,* 1-9.

Balliauw, M., Bosmans, J., & Pauwels, D. (2022). Does the quality of a youth academy impact a football player's market value? *Sport, Business and Management: An International Journal*, *12*(3), 269–283. https://doi.org/10.1108/SBM-02-2021-0011

Bardin, L. (2004). *Análise de conteúdo*. 3. ed. Edições

Beswick, B. (2016). *Odak noktamız futbol: Oyun zihinde nasıl kazanılır?* Remzi Kitabevi.

Çevik, S., & Onağ, Z. (2019). Qualitative research on reasons why Turkish football clubs are unable to train youth team players well and possible solutions. *CBÜ Beden Eğitimi ve Spor Bilimleri Dergisi*, *14*(2), 326-343

Chelladurai, P. (2014). *Managing organizations for sport and physical activity: A systems perspective* (4th ed.). Routledge.

Côté, J., & Gilbert, W. (2014). Talent is nurtured: Implications for sport policy. *International Journal of Sport Policy and Politics*, *6*(4), 575-593

Côté, J., Erickson, K., & Duffy, P. (2013). Developing the expert performance coach. In D. Farrow, J. Baker, C. MacMahon (Eds.), *Developing elite sport performance: Lesson from theory and practice* (pp. 17-28; 2nd edition). Routledge

Côté, J., Murphy-Mills, J., & Abernethy, B. (2012). The development of skill in sport. In: Hodges, N., and Williams A.M. (eds) *Skill acquisition in sport: Research, theory and practice (*pp.269–286*)*. Routledge

Coutinho, P., Ribeiro, J., da Silva, S.M., Fonseca, A.M., and Mesquita, I. (2021). The Influence of Parents, Coaches, and Peers in the Long-Term Development of Highly Skilled and Less Skilled Volleyball Players. *Front. Psychol., 12,* Article 667542. https://doi.org/10.3389/fpsyg.2021.667542

Coyle, D. (2009). *The talent code.* Random House.

Cumming, S. P., Lloyd, R. S., Oliver, J. L., Eisenmann, J. C., & Malina, R. M. (2017). Bio-banding in sport: applications to competition, talent identification, and strength and conditioning of youth athletes. *Strength Condition J.*, *39*, 34–47. http://dx.doi.org/10.1519/SSC.0000000000000281

Cushion, C. J., Ford, P. R., & Williams, A. M. (2012). Coach behaviors and practice structures in youth soccer: Implications for talent development. *Journal of Sports Sciences*, *30*(15), 1631–1641

Cushion, C.J., & Jones, R.L. (2006). Power, discourse, and symbolic violence in professional youth soccer: The case of Albion football club. *Sociology of Sport Journal*, *23*,142–161. https://doi.org/10.1123/ssj.23.2.142

Erdal, R., (2017). *Sporda Yönetişim & Organizasyon: Spor organizasyonları planlama ve yönetimi*. Spor Yayınevi

Ericsson, K. A. (2003). How the expert performance approach differs from traditional approaches to expertise in sport: In search of a shared theoretical framework for studying expert performance. In K. A. Ericsson & J. Starkes (Eds.), *Expert performance in sport: Advances in research on sport expertise*. (pp. 371–402). Champaign, IL: Human Kinetics

Farrow, D., Baker J., & MacMahon, C. (2013). *Developing sport expertise: Researchers and coaches put theory into practice*. Routledge

Freeman, R. (2010). *Strategic management: A stakeholder approach*. Cambridge University Press.

Gallahue, D.L., Ozmun, J.C. and Goodway, J. (2012). *Understanding motor development: Infants, children, adolescents, adults*. McGraw-Hill.

Gulbin, J., Weissensteiner, J., Oldenziel, K., & Gagné, F. (2013). Patterns of performance development in elite athletes. *European Journal of Sport Science*, *13*, 605-614. https://doi.org/10.1080/17461391.2012.756542

Haugaasen, M., Toering, T., & Jordet, G. (2014). From childhood to senior professional football: A multi-level approach to elite youth football players' engagement in football-specific activities. *Psychology of Sport and Exercise*, *15*(4), 336-344. https://doi.org/10.1016/j.psychsport.2014.02.007

Helsen, W, Hodges, N., J., Van Winckel, & Starkes, J. L. (2000). The roles of talent, physical precocity and practice in the development of soccer expertise. *Journal of Sports Sciences*, *18*(9), 727-736. https://doi.org/10.1080/02640410050120104

Höner, O., & Feichtinger, P. (2016). Psychological talent predictors in early adolescence and their empirical relationship with current and future performance in soccer. *Psychology of Sport and Exercise*, *25*, 17–26. https://doi.org/10.1016/j.psychsport.2016.03.004

Höner, O., Murr, D., Larkin, P., Schreiner, R. & Leyhr, D. (2021). Nationwide subjective and objective assessments of potential talent predictors in elite youth soccer: An Investigation of prognostic validity in a prospective study. *Front. Sports Active Living*, *3*, Article 638227. https://doi.org/10.3389/fspor.2021.638227

Houlihan, B., & Green, M. (2008). *Comparative Elite sport development: Systems, structures and public policy*. Elsevier

Hylton, K. (2013). *Sports development: Policy, process and practice*. Routledge.

Kaplan, T. (2016). *Futbol: Antrenörlük eğitiminde kavramsal boyutlar.* Palet Yayınları

Lapiano, D. A., & Zotos, C. (2023). *Athletic director's desk reference*. 2nd Revised Edition. Human Kinetics

Larsen, C., H., Storm, L., Sæther, S., Pyrdol, N., & Henriksen, K. (2020). A world class academy in professional football: The case of Ajax Amsterdam. *Scandinavian Journal of Sport and Exercise Psychology, 2,* 33-43. https://doi.org/10.7146/sjsep.v2i0.119746

Lee, G. (2021). Clarifying the complexities of qualitative research: A Book review of Phillip Adu's a step-by-step guide to qualitative data coding. *The Qualitative Report*, *26*(7), 2168-2170. https://doi.org/10.46743/2160-3715/2021.4947

Machado, G., González-Víllora, S., & Teoldo, I. (2023). Selected soccer players are quicker and better decision-makers in elite Brazilian youth academies. *International Journal of Performance Analysis in Sport*, *23*(2), 65–82. https://doi.org/10.1080/24748668.2023.2181609

Mannix, P., Roberts, S. J., Enright, K., & Littlewood, M. (2023). Surveying the youth-to-senior transition landscape in Major League Soccer: a new frontier. *Science and Medicine in Football*, *8*(4), 365–373. https://doi.org/10.1080/24733938.2023.2272605

McCalman, W., Goddard, S. G., Fransen, J., Crowley-McHattan, Z. J., & Bennett, K. J. M. (2023). Experienced academy soccer coaches' perspectives on players' skilfulness. *Science and Medicine in Football*, *8*(4), 386–396. https://doi.org/10.1080/24733938.2023.2280230

McGrath, J., & Bates, B. (2017). *The little book of big management theories and how to use them*. Pearson Business

McGuigan, M., Dello Iacono, A., McRobert, A., Cowan, D., & Unnithan, V. B. (2024). Facilitators and barriers associated with youth player transition to professional first-team football: A key stakeholder perspective. *International Journal of Sports Science & Coaching*, *19*(3), 988-998. https://doi.org/10.1177/17479541231184022

Mesquita, I., Coutinho, P., De Martin-Silva, L., Parente, B., Faria, M. & Afonso, J. (2015). The value of indirect teaching strategies in enhancing student-coaches' learning engagement. *Journal of Sports Science and Medicine, 14,* 657–668.

Mills, A., Butt, J., Maynard, I., & Harwood, C. (2014). Toward an understanding of optimal development environments within elite English soccer academies. *The Sport Psychologist*, *28*(2), 137–150. https://doi.org/10.1123/tsp.2013-0018

Mitchell T., Gledhill A., Nesti M., Richardson D., Littlewood M. (2020). Practitioner perspectives on the barriers associated with youth-to-senior transition in elite youth soccer academy players. *International Sport Coaching Journal, 7,* 273–282. https://doi.org/10.1123/iscj.2019-0015

Mohammadi, S., & Dehkordi, F. (2013). The relationship between job satisfaction and its aspects with the organizational commitment among the staffs of the youth and the sport department in Charmahal & Bakhtiari. *J. Sport Science*, *6*(2), 77-81.

Moran, A., & Toner, J. (2017). *A Critical introduction to sport psychology*. (3rd ed.). Routledge

Moser, A., & Korstjens, I. (2017). Series: Practical guidance to qualitative research. Part 3: Sampling, data collection and analysis. *European Journal of General Practice*, *24*(1), 9-18. https://doi.org/10.1080/13814788.2017.1375091

Nesti, M., & Sulley, C. (2015). *Youth development in football: Lessons from the world's best academies*. Routledge

New, P., & Gill, W. (2010). Academy football: Stressed to the bone. *SportEX Medicine*, *43*, 22-27

North, J., Lara-Bercial, S., Morgan, G., & Rongen, F. (2014). The identification of good practice principles to inform player development and coaching in European youth football – UEFA Research Project, Leeds Beckett University, UK.

O'Connor, D., Larkin, P., & Williams, A. M. (2017). Observations of youth football training: How do coaches structure training sessions for player development? *Journal of Sports Sciences*, *36*(1), 39–47. https://doi.org/10.1080/02640414.2016.1277034

Patton, M. (2015). *Qualitative research and evaluation methods*. 4th ed., SAGE Publications

Poli, R., Ravenel, L., & Besson, R. (2016): *CIES Football Observatory Report n°19* - Retrieved at https://football-observatory.com/Demographic-study-of-football-in-Europe

Rabionet, S. E. (2011). How i learned to design and conduct semi-structured interviews: An Ongoing and continuous journey. *The Qualitative Report*, *16*(2), 563-566. https://doi.org/10.46743/2160-3715/2011.1070

Relvas, H., Littlewood, M., Nesti, M., Gilbourne, D., & Richardson, D. (2010). Organizational structures and working practices in elite European professional football clubs: Understanding the relationship between youth and professional domains. *European Sport Management Quarterly*, *10*(2), 165–187. https://doi.org/10.1080/16184740903559891

Reverberi, E., D'Angelo, C., Littlewood, M.A., & Gozzoli, C.F. (2020). Youth football players' psychological well-being: The key role of relationships. *Frontiers in Psychology*, *11*,567776. https://doi.org/10.3389/fpsyg.2020.567776

Roca, A., Williams, A. M., & Ford, P. R. (2012). Developmental activities and the acquisition of superior anticipation and decision making in soccer players. *Journal of Sports Sciences*, *30*(15), 1643–1652. https://doi.org/10.1080/02640414.2012.701761

Roynesdal, O. (2015). *The transition from academy to professional football*. Master Thesis presented in Sport Sciences Department of Coaching and Psychology to Norwegian School of Sport Sciences.

Sarmento, H., Anguera, M. T., Pereira, A., & Araújo, D. (2018). Talent Identification & Development in Male Football: A Systematic Review. *Sports Medicine*, *48*(4), 907-931. https://doi.org/10.1007/s40279-017-0851-7

Schreier, M. (2014). *Qualitative content analysis*. SAGE Publications.

Şenel, E., & Saygın, Ö. (2021). The comparison of football academy systems between Turkey and England, *International Journal of Sport Culture and Science 9*(4), 387-412

Sivrikaya, M. H. (2018). The Role of self-efficacy on performance of sports skills of football players. *Journal of Education and Training Studies, 6*(12a), 75-79. https://doi.org/10.11114/jets.v6i12a.3952

Stotlar, D.K. & Wonders, A. (2006). Developing elite athletes: A content analysis of US national governing body system. *International Journal of Applied Sports Sciences, 18*(2), 121-144.

Sunay, H., & Kaya, B. (2018). Türkiye ile Almanya futbol altyapılarının karşılaştırılması. *Spormetre, 16*(4), 126-139.

Sweeney, L., Horan, D., & MacNamara, Á. (2021). Premature professionalization or early engagement? Examining practise in football player pathways. *Frontiers Sports and Active Living 3,* Article 660167. https://doi.org/10.3389/fspor.2021.660167

Topkaya, I. (2015). *Futbolda Altyapı Eğitimi: Altyapıya ilişkin genel bir çerçece ve altyapı eğitiminde pedagojik yaklaşım*. Paradigma Akademi Yayınları

Veal, A.J., & Darcy, S. (2014). *Research methods in sport studies and sport management: A Practical guide* (1st ed.). Routledge.

Whiting, L. (2008). Semi-structured interviews: Guidance for novice researchers. *Nursing Standard., 22,* 35-40. http://dx.doi.org/10.7748/ns2008.02.22.23.35.c6420

Wylleman, P., Alfermann, D., & Lavallee, D. (2004). Career transitions in sport: European perspectives. *Psychology of Sport and Exercise, 5*(1), 7–20. https://doi.org/10.1016/S1469-0292(02)00049-3

Xiang, C., Dong, W., Kamalden, T. F. T., Ismail, N., & Luo, H. (2024). Structural analysis of environmental factors of sports talent development. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues, 43*(7), 6516–6532. https://doi.org/10.1007/s12144-023-04803-x

Zibung, M., & Conzelmann, A. (2013). The role of specialisation in the promotion of young football talents: a person-oriented study. *European J. Sport Science, 13,* 452–460. https://doi.org/10.1080/17461391.2012.749947

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Examination of the Relationship Between High School Students' Physical Activity Levels and Perceived Social Support Levels*

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Abstract

This study aimed to investigate the relationship between high school students' physical activity level and perceived social support level. Additionally, the study aims to evaluate the impact of certain socio-demographic variables on these two characteristics. The study sample consisted of a total of 553 high school students studying in the Kadirli district of Osmaniye province during the 2022-2023 academic year. This group includes 167 students from the Science High School, 275 students from the Anatolian High School, and 111 students from the Vocational and Technical Anatolian High School. A 'Personal Information Form,' specifically designed for this study, was used to collect data. Additionally, the 'Cognitive Behavioural Physical Activity Questionnaire,' developed by Schembre et al. (2015) and adapted into Turkish by Eskiler et al. (2016a), was used. The revised form of the 'Multidimensional Scale of Perceived Social Support,' developed by Zimet et al. (1988) and adapted into Turkish by Eker et al. (1995a), and revised by Eker et al. (2001), was utilized as a data collection tool. The analysis of the collected data was conducted using the SPSS software package. The research results indicate a low to moderate positive relationship between students' physical activity levels and their perceived social support levels in the sub-dimensions and total scales ($p<0.01$). Additionally, significant differences were found in some sub-dimensions and total scales between students' physical activity levels and perceived social support levels based on certain demographic variables ($p<0.05$). These findings are significant for understanding the relationship between physical activity and social support and for evaluating the impact of demographic factors on this relationship.
Keywords: High school students, Physical activity, Perceived social support

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INTRODUCTION

Humans have always had an inclination to stay active since birth. Similar, to living creatures' humans need to be able to adapt to environmental conditions protect themselves from challenges and fulfill their needs even in the toughest situations. The significance of activity is crucial in this context. Physical activity involves using the bodys muscles to perform movements that increase energy expenditure by boosting metabolism (Zorba & Saygın, 2009). Encouraging a lifestyle can motivate individuals to engage in activities and maintain a regular exercise routine. Moreover, interactions with family members and friends receiving support and observing role models can all contribute to embracing physical activities (Küçükibiş & Eskiler, 2019).

People thrive when they engage in connections that come naturally to them. The social circles people are part of play a role, in shaping their wellbeing (Gümüş et al., 2019). Furthermore, physical activity also plays a role in determining individuals wellbeing. Various factors influence people's participation in activities, with perceived social support being highlighted as a motivator (Lindsay-Smith et al., 2017; Scarapicchia et al., 2017).

Physical activity not only protects young people's physical health, but also positively affects their mental and emotional health. Recent research shows that regular physical activity reduces young people's stress levels, increases their academic performance, and improves their overall life satisfaction (Biddle et al., 2019; Menglong & Yujia, 2024). Research, especially among high school students, shows that physical activity supports cognitive functions and can increase school success (Neil et al., 2020). It is stated that doing sports in adolescents is beneficial in terms of long-term health protection as well as positive effects on improving interpersonal relationships (Loh et al., 2019).

The teenage years are a stage where individuals may face the risk of gaining weight due to imbalanced and unhealthy eating habits. It is essential to assess individuals eating patterns and daily physical activity levels for preventing health issues associated with nutrition during adulthood. Therefore, advocating for eating habits and an active way of life among adolescents holds importance, for public health (Akca & Selen, 2015).

Adolescence is a time, between childhood and young adulthood marked by changes in physical, cognitive and emotional aspects. Despite these changes this period also brings opportunities for growth. Social support plays a role in helping adolescents understand their behaviors and development. It includes assistance, concern and kindness from others (Sarah, 2011).

Social support can manifest in ways socially whether actively provided, requested or received passively (Vietze, 2011). Perceived social support refers to how an individual assesses the sufficiency and usefulness of their circle (Sorias, 1988). Also, social support plays an important

role in the mental and physical health of individuals. The perception of social support can directly affect stress coping skills, self-esteem, and overall quality of life (Cohen & McKay, 2020). Especially among young students, the perception of social support has been shown to have strong effects on academic achievement and mental well-being. Sources of social support include forms of support from family members, friends and teachers, and this support can improve students' general health status (Özhan & Yüksel, 2022).

Social support entails the help that individuals receive from their circles, including family members, friends, relatives and community members (Cunningham & Barbee, 2000). During the years parents play a role, as a primary source of support. It is emphasized that the support offered during this phase significantly contributes to safeguarding and enhancing wellbeing (Hurley et al., 2017).

The interaction between physical activity and social support is acknowledged as a factor influencing the physical and mental health of adolescents. The available evidence suggests that social support can motivate individuals to engage in physical activity, while physical exercise can enhance their perception of social support (Satman, 2018). A substantial body of research has been conducted on the topic of support for youth engaged in activities and sports (Gill et al., 2018; Haidar et al., 2018; İlhan & Taşkın, 2019; Kastrati & Georgiev, 2020; Oosterhoff et al., 2017; Reimers et al., 2019; Shen et al., 2018; Vazquez & Schuler, 2020; Wilk et al., 2018).

The influence of peer support for exercise on a number of factors, including the frequency of exercise, the location of exercise, gender, parental educational level, academic performance, weight status and field of study, has been the subject of extensive research. The findings of this study indicate that the impact of perceived social support for physical activity on physical well-being among students of diverse high school types differs from that observed in previous studies. Furthermore, several studies have underscored the significance of peer support in the context of sport participation (Opstoel et al., 2020; Prochaska et al., 2002; Smith, 2003). This research project primarily aims to examine the role of social support systems in shaping young people's physical activity habits and to develop strategies that promote healthy lifestyle choices.

METHOD

Research Model

The objective of this study is to investigate the relationship between the physical activity levels of high school students and their perception of the level of support they receive. To accomplish this goal, a descriptive survey approach was utilized. A convenience sampling technique was employed for selecting participants (Karasar, 2008).

Research Group

The research was conducted with the participation of students from 14 educational institutions in the Kadirli district of Osmaniye province, under the guidance of the National Directorate of Education, during the 2022-2023 academic semester. These schools comprised of 8 schools (with 275 students) 1 science school (with 167 students) and 5 vocational and technical Anatolian high schools (with 111 students). The age distribution among the participating students is as follows; 22.7% (126) are aged 14, 19% (105) are aged 15, 18.8% (104) are aged 16 while those aged17 and18 make up 21.5% (122) and 17.4% (96) respectively. The research group was made up of an of 553 students, with 00being and 43.9% (243students) being male.

Data Collection Tools

In addition to the demographic information form (gender, age, grade, field of study, type of high school, parental employment status, family monthly income level), the Cognitive Behavioral Physical Activity Scale developed by Schembre et al. (2015) and adapted into Turkish by Eskiler et al. (2016a). This scale includes three main sub-dimensions: 'outcome expectancy', "self-regulation" and "personal barriers". The scale, which consists of 15 statements in total, was evaluated using a five-point Likert scale ranging from '1. strongly disagree' to '5. strongly agree' for each statement. Cronbach alpha internal consistency coefficient of the scale was calculated as (α=0.84). The values of the sub-dimensions are (α=0,85) for 'outcome expectancy', (α=0,79) for 'self-regulation' and (α=0,64) for 'personal barriers.

In the measurement of social support levels, the Multidimensional Perceived Social Support Scale developed by Zimet et al. (1988) and adapted into Turkish by Eker and Arkar (1995a) was preferred. This scale includes three subscales measuring the support received from family, friends and a special individual and the statements are scored on a seven-point Likert scale ranging from '1. Absolutely No' to '7. Absolutely Yes'. The internal consistency of the scale was found to be between α=0.80 and α=0.95 in the study conducted by Eker et al. (2001). This result indicates a very high internal consistency.

Ethical Approval

In compliance with ethical guidelines, this study was approved by the Selcuk University Ethics Committee with the decision numbered 143 and dated 09.11.2022.

Data Collection

After obtaining the necessary permissions, the data collection instruments were distributed to participants through surveys created on Google Forms. Data from participants who consented to the voluntary participation form online were considered.

Analysis of Data

In the course of the data analysis, we employed exploratory data analysis techniques to corroborate the data distribution. In order to assess the impact of the factors in question, a series of tests were conducted. These included independent samples t-tests, which were applied for the purpose of facilitating comparisons involving variables. Additionally, a one-way analysis of variance (ANOVA) was employed. Subsequent, to the ANOVA findings several multiple comparison tests like Tukey HSD, LSD or Tamhanes T2 were carried out with consideration given to variances equality. To explore the connections between the variables we computed the Pearson Product Moment Correlation Coefficient (r) which classified relationship strengths as high (0.70 1.00) 0.30 0.70) and low (0.00 0.30) in line with Büyüköztürk (2007). The significance level was established at 0.05.

FINDINGS

Table 1. Physical activity levels by participants' gender

Variables	Gender	N	X	SS	Sd	T	p
Outcome Expectations	Male	243	4,03	0,97	551	2,000	0,046*
	Female	310	3,86	0,98			
Self-Regulation	Male	243	3,23	1,13	551	3,654	0,000*
	Female	310	2,87	1,13			
Personal Barriers	Male	243	2,80	1,02	551	-3,933	0,000*
	Female	310	3,14	1,00			
Total Scale	Male	243	4,46	2,20	551	4,298	0,000*
	Female	310	3,60	2,45			

***p<0,05**

The mean scores of the students for ‘outcome expectancy (positive-negative)’, ‘self-regulation (management, planning, goal setting)’ sub-dimensions of the scale and the overall scale (X = 3,86, X = 4,03), (X= 4,46, X= 3,60) in favour of male students (p<0,05), and the mean scores of ‘personal barriers sub-dimension (X= 2,80, X= 3,14) (insufficient ability, lack of social support, environmental constraints, time, self-confidence and old motivation)’ differed significantly in favour of female students (p<0,05).

Table 2. Physical activity levels by participants' age

Variables	Age		N	X	SS	F	p	Tukey
Outcome Expectations	A	14	126	3,90	0,92	0,543	0,704	-
	B	15	105	3,89	1,05			
	C	16	104	3,92	0,99			
	D	17	122	3,94	0,98			
	E	18	96	4,07	0,97			
Self-Regulation	A	14	126	3,04	1,08	0,923	0,450	-
	B	15	105	2,90	1,17			
	C	16	104	3,02	1,17			
	D	17	122	3,00	1,15			
	E	18	96	3,20	1,14			
Personal Barriers	A	14	126	2,87	0,95	3,240	0,012*	E>B
	B	15	105	2,78	1,12			
	C	16	104	3,04	0,98			
	D	17	122	3,05	0,97			
	E	18	96	3,25	1,05			
Total Scale	A	14	126	4,07	2,26	0,129	0,972	-
	B	15	105	4,01	2,83			
	C	16	104	3,90	2,32			
	D	17	122	3,89	2,40			
	E	18	96	4,02	2,05			

***p<0,05**

These findings reveal that the mean scores of the 'outcome expectancy', 'self-regulation' sub-dimensions of the scale and the mean scores of the general scale (X = 4,07, X = 3,89) do not differ significantly with the age of the students (p>0,05). However, it was observed that the mean scores of the 'personal barriers' sub-dimension of the scale differed significantly with the age of the students (X = 3,25, X = 2,78). Among secondary school students, it was found that the personal barriers encountered by 18-year-old students in physical activities were statistically significantly higher than 15-year-old students.

Table 3. Physical activity levels by participants' grade levels

Variables	Grade		N	X	SS	F	p	Tukey
Outcome Expectations	A	9	159	3,95	0,93	2,310	0,075	-
	B	10	87	3,70	1,11			
	C	11	151	3,97	0,99			
	D	12	156	4,03	0,93			
Self-Regulation	A	9	159	3,03	1,09	0,952	0,415	-
	B	10	87	2,86	1,26			
	C	11	151	3,03	1,12			
	D	12	156	3,12	1,14			
Personal Barriers	A	9	159	2,80	0,98	5,568	0,001*	D>A D>B
	B	10	87	2,84	1,11			
	C	11	151	3,03	1,01			
	D	12	156	3,23	0,98			
Total Scale	A	9	159	4,19	2,38	0,784	0,503	-
	B	10	87	3,72	2,72			
	C	11	151	3,96	2,41			
	D	12	156	3,92	2,13			

***p<0,05**

These data show that there is no statistically significant difference (p>0.05) between the age of the students and the mean scores of the 'outcome expectancy' and 'self-regulation' sub-dimensions of the scale (X= 4.03, X= 3.70). However, there was a significant difference between the grade levels of the students and the mean scores of the 'personal barriers' sub-dimension of the scale (X=3,23, X=2,80, X=2,84). In addition, it was determined that the personal barriers perceived by the 12th grade students during physical activity were significantly higher than the 9th and 10th grade students.

Table 4. Perceived levels of social support by participants' age

Variables	Age		N	X	SS	F	p	Tukey
	A	14	126	23,48	4,57			
	B	15	105	23,04	4,42			
Family	C	16	104	23,2	4,5	0,847	0,496	-
	D	17	122	22,9	4,08			
	E	18	96	22,39	5,11			
	A	14	126	23	4,41			
	B	15	105	22,78	4,86			
Friends	C	16	104	23,18	4,82	0,157	0,96	-
	D	17	122	22,77	4,6			
	E	18	96	22,8	5,17			
	A	14	126	19,11	5,6			
	B	15	105	17,74	5,71			
Significant Other	C	16	104	19,73	5,92	3,93	0,004*	E>B
	D	17	122	19,54	6,06			
	E	18	96	20,95	6,17			
	A	14	126	65,6	11			
	B	15	105	63,57	11,21			
Total Scale	C	16	104	66,11	12,14	0,834	0,504	-
	D	17	122	65,22	10,89			
	E	18	96	66,15	13,98			

***p<0,05**

These findings indicate that students' ages do not have a significant impact on the mean scores of the "family" and "friends" sub-dimensions, as well as the overall scale scores (X= 23.48, X= 23.18) (p>0.05). However, there is a significant difference in the mean scores of the "significant other" sub-dimension (X= 20.95, X= 17.74) (p<0.05). The analyses show that 18-year-old high school students perceive significantly higher levels of social support from a "significant other" compared to 15-year-old students.

Table 5. Perceived levels of social support by participants' grade levels

Variables	Grade		N	X	SS	F	p	LSD
Family	A	9	159	23,44	4,40	1,578	0,194	-
	B	10	87	22,49	4,88			
	C	11	151	23,35	4,29			
	D	12	156	22,60	4,62			
Friends	A	9	159	23,03	4,44	0,167	0,919	-
	B	10	87	23,01	5,04			
	C	11	151	22,68	4,75			
	D	12	156	22,94	4,89			
Significant Other	A	9	159	18,94	5,70	2,636	0,049*	D>A D>B
	B	10	87	18,36	5,73			
	C	11	151	19,39	5,91			
	D	12	156	20,39	6,26			
Total Scale	A	9.	159	65,42	10,78	0,588	0,623	-
	B	10	87	63,87	12,23			
	C	11	151	65,42	11,87			
	D	12	156	65,94	12,48			

***p<0,05**

According to these findings, there is no significant difference between the grade levels of high school students and the 'family' and 'friend' sub-dimensions and their overall mean scores (X= 23.44, X= 23.03) (p>0.05). However, it was observed that the mean scores in the 'special person' sub-dimension changed significantly (X= 20,39; X= 18,36-18,94) (p<0,05). According to the test results, it was determined that the 12th grade students' perception of social support levels was significantly higher in the "special person" sub-dimension compared to the 9th and 10th grade students.

Table 6. The Relationship between participants' physical activity levels and perceived levels of social support

			Multidimensional Perceived Social Support Scale			
			Family	Friends	Significant Other	Total Scale
Cognitive Behavioral Physical Activity Scale	Outcome Expectations	r	0,336**	0,258**	0,185**	0,326**
		p	0,000	0,000	0,000	0,000
	Self-Regulation	r	0,314**	0,191**	0,201**	0,299**
		p	0,000	0,000	0,000	0,000
	Personal Barriers	r	-0,020	0,049	0,063	0,044
		p	0,639	0,252	0,137	0,303
	Total Scale	r	0,298**	0,177**	0,146**	0,259**
		p	0,000	0,000	0,001	0,000

** Significant at the 0.05 level ** Significant at the 0.01 level*

Analyses conducted on high school students reveal a moderate positive relationship between the "outcome expectation" and "self-regulation" sub-dimensions of the Cognitive Behavioural Physical Activity Scale and the "family" sub-dimension of the Multidimensional Scale of

Perceived Social Support (r=0.336 and r=0.314; p<0.01). In contrast, low-level positive relationships were observed between the "friends" and "significant other" sub-dimensions and the corresponding sub-dimensions of these scales (r values 0.258 and 0.185; 0.191 and 0.201, respectively; p<0.01). These results indicate that the social support received from families significantly enhances students' positive outcome expectations and self-regulation skills towards physical activity. In contrast, the influence of support from friends and significant others is more limited.

DISCUSSION

Significant differences based on gender were uncovered in how high school students perceive and approach activity. Our research showed that male students scored higher in areas, like 'outcome expectations,' 'self-regulation '. Overall assessment compared to their female counterparts. On the hand female students displayed scores in the 'personal barriers aspect. These results align with studies conducted by Ayhan et al., (2021), Gülbetekin et al., (2021). Atasoy and Altun (2018). A recent study found that teenage girls engage in activity frequently and intensely compared to boys (Shennar-Golan & Walter, 2018). Ren et al., (2020) explored the link between activity, social support and self-efficacy among individuals. The study revealed that having a sense of self efficacy plays a role in how social support influences teenagers' participation in physical activities. Additionally, another study highlighted the disparity in activity levels between girls and boys.

In the study on physical activity in adolescence conducted by Hilland et al., (2011), it was concluded that male students participated in physical activity more than female students. Eskiler et al., (2016b) and Tokmak (2022) also highlighted gender related distinctions in how students view activity particularly noting differences in 'self-regulation' for males and 'personal barriers for females. Doğaner (2019) found that males held greater 'outcome expectations regarding activity compared to females. Additionally, Hudson (2000), Tomik et al., (2012), Singh and Devi (2013) as Alagöz (2019) all pointed out significant gender disparities in students' engagement levels with physical activities. The higher scores seen in males for 'self-regulation' indicate an involvement, in physical activities compared to females.

There may be several possible reasons for this result. Firstly, gender roles and expectations may encourage boys to participate more in sport activities, while limiting girls' participation. Boys are generally more encouraged to play sports and this may lead them to have higher 'self-regulation' scores. Girls, on the other hand, may face more personal barriers such as body image, social acceptance and safety concerns. These concerns may lead them to avoid physical activities.

The education system and sports facilities offered by schools may also affect this situation. While more sports clubs and opportunities for boys may increase their participation in physical activities, limited opportunities for girls may negatively affect participation.

In our research we found that peoples overall attitudes and behaviors, towards activity well as their expectations of the outcomes were not significantly influenced by age. However, we did notice differences in the personal barrier's aspect based on age. Mullen and Whaley (2010) observed that younger and middle-aged individuals tend to engage in activities more than older individuals. Sarvan Cengiz et al., (2022) discovered a decline in outcome expectations, self-regulation and overall scores as individuals age.

Some studies present results to ours. Hazar et al., (2017) and Doğaner (2019) noted no variations in outcome expectations, self-regulation and personal barriers concerning age using the BDFA scale. Nevertheless, Ayhan et al., (2021) identified age related distinctions in self-regulation within the BDFA scale with scores seen in the 24-26 age bracket. University students within this range exhibited attitudes towards incorporating physical activities into their daily routines. These discrepancies could be due to variations, in sample groups utilized across studies. Also, Taymoori et al., (2009) found a decrease in the rate of participation in physical activity as individuals aged. It is thought that the reason for this is that young individuals are in the age of play and as they grow older, the maturing individual realizes the seriousness of life and becomes concerned about the future.

There were no variations, in students' overall attitudes and behaviors towards activity across different class levels except for a significant disparity in the 'personal barriers aspect. Final year students were reported to have decreased activity levels due to exam stress and increased academic workload resulting in an active lifestyle (Ünlü, 2010).

Additionally, Çakır (2019) discovered a decline in the reasons sub dimension of the Physical Activity 'Participation Motivation Scale' among high school students at class levels. However, studies by Küçükibiş (2016) Akköse (2020) and Birgün et al., (2020) did not find any differences in motivation for activity based on class level. These inconsistencies may be attributed to variations in sample sizes and measurement scales.

Several possible reasons for these inconsistencies can be considered. Firstly, differences in sample sizes may affect the overall validity of the results. Small sample groups may limit the capacity to obtain results that appeal to large audiences. In addition, the demographic and socioeconomic characteristics of the student group may play a decisive role in participation levels. For example, students from families with different income levels may have different interests and opportunities for physical activity.

In addition, the education system and the sports facilities offered by schools can also determine students' interaction with sports. School sport policies and teachers 'methods of encouraging sport activities directly affect students' participation in sport activities. Better sport facilities and a supportive school environment can increase students' interest in sport, while inadequate facilities and lack of support can decrease interest.

In conclusion, factors such as sample size, demographic factors and sport facilities offered by the educational environment may play an important role in explaining the differences in students' levels of participation in physical activity. Therefore, it is necessary to evaluate the findings of such studies in a more comprehensive and holistic manner. Moreover, Tokmak research (2022) indicated discrepancies in the 'outcome expectations subdimension scores of the BDFA scale depending on class level. Alagöz (2019) also highlighted variations in scores and the 'self-regulation' sub dimension relative, to different class levels.

When it comes to the perception of support there weren't any variations in overall levels of support across different age groups. However, there were differences observed in the support received from 'significant others.' A study by Arslansan (2022) revealed that high school students tend to receive support from friends as they get older. Aydoğan (2022) noted differences in the family related aspect of support based on age. İlter (2018) also discovered age related changes in perceived social support levels within the family and 'significant others contexts. Similarly, the academic year was found to have no impact on the level of support received from family and friends. However, significant discrepancies were observed in the support provided by 'significant others'. Khan et al., (2020) concluded in their study on adolescents that the participation of young people who receive the support of their parents in physical activity is high and this result coincides with our result. In studies conducted on high school students, significant differences were identified in the sub-dimension of social support received from a 'special person' and in the general social support scale, contingent on the grade variable (Arslansan, 2022; Ataş, 2021). Furthermore, significant variation was observed in the perceived level of social support within the family and friendship sub-dimensions, according to the class variable (İlhan, 2018; İlter, 2018). In other studies, a significant discrepancy was found in the perception of social support within the family domain among high school students, according to their class variable (Mermer, 2023; Orman, 2016).

Telama and Yang (2000), Caspersen et al., (2000) examined the physical activity level of Finnish children and adults of different age groups and found that there was a significant decrease in the physical activity level of individuals from the age of 12 years. Although the reasons for the decrease in physical activity level with age are not fully understood, increasing responsibilities with age (Matton et al., (2006), changes in the motivation required to participate in activity with age Telama and Yang (2000) and changes in psychological, social and physical environment

variables affecting participation in physical activity (Sallis, 2000) can be considered among the reasons for the decrease in physical activity level with age.

This research also backs the idea that there is a connection, between social support and self confidence in individuals. Specifically social support plays a role, in both indirectly influencing the activity levels of teenagers. Various researchers have highlighted this link well (Lindsay-Smith et al., 2017; Scarapicchia et al., 2017). Essentially what this discovery suggests is that individuals who feel they receive support are likely to engage in more physical activity later on (Scarapicchia et al., 2017).

CONCLUSIONS

Studies indicate distinctions, between female students in terms of physical activity. Male students tend to view the outcomes of activities positively and demonstrate better self-regulation skills. This implies that males might have an inclination and ability to plan for activities leading to higher levels of engagement. Conversely female students often encounter obstacles that hinder their motivation and active participation in activities. Challenges such as lack of support, environmental limitations and low self-esteem can contribute to reduced involvement in activities among female students.

As individuals grow older their awareness of barriers tends to increase thereby potentially impeding their engagement in activity. Research highlights the impact of age on perceived barriers indicating that these obstacles become more prominent with advancing age. This suggests that age related changes could influence motivation and participation levels in activity.

The correlation between level and perceived personal barriers suggests that students in grades may face more hindrances to engaging in physical activity, which could dampen their motivation. This emphasizes the need for educators and health professionals to take into account grade level differences when designing interventions, for promoting activity.

The research emphasizes the importance of family backing, in boosting students optimistic outlook and self-control in relation to exercise while support, from friends and partners has an influence. Therefore, prioritizing family assistance could be a approach to encourage physical activity.

Recommendations

1. It would be beneficial to encourage high school students to incorporate activities into their daily routines in order to facilitate a more active lifestyle.

2. It is essential to identify the underlying reasons for students' reluctance to participate in physical activities, such as the lack of suitable facilities and the influence of social pressures. Once these factors have been elucidated, strategies to overcome these obstacles must be devised.

3. The promotion of attitudes and behaviors towards physical activity among female students has the potential to positively impact community-wide physical activity levels and contribute to improved public health outcomes.

4. It is of the utmost importance to identify and tackle the obstacles that students may encounter, including time management difficulties, a lack of motivation, self-confidence issues and an absence of adequate social support structures. In order to foster a positive attitude towards physical activity, it is crucial to implement support structures that can effectively address the aforementioned challenges.

5. It is recommended that high school students be provided with assistance in overcoming the barriers that hinder their participation in physical activities. This is with the aim of improving their attitudes towards exercise and boosting their engagement levels.

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REFERENCES

Akça, S. O., & Selen, F. (2015). Üniversite öğrencilerinin öğün atlamaları ve günlük fiziksel aktivitelerinin beden kütle indeksi (BKİ) üzerine etkisi. *TAF Preventive Medicine Bulletin, 14(5),* 394-400.

Akköse, H. N. (2020). *Lise öğrencilerinin dijital oyun oynama motivasyonları ile fiziksel aktiviteye katılım motivasyonlarının incelenmesi (*Master's thesis, Gazi University Institute of Educational Sciences). Ankara.

Alagöz, N. (2019). *Ortaöğretim öğrencilerinin fiziksel aktivite düzeyleri ile internet ve oyun bağımlılığı ilişkisi* (Master's thesis, Inonu University Institute of Health Sciences). Malatya.

Arslansan, R. (2022). *Lise öğrencilerinde gelecek beklentisinin mesleki olgunluk ve algılanan sosyal destek açısından incelenmesi* (Master's thesis, Selcuk University Institute of Educational Sciences). Konya.

Ataş, M. (2021). *Ergenlerin mobil telefonsuz kalma korkusu (nomofobi), stresle başa çıkabilme ve algılanan sosyal destek düzeyleri arasındaki ilişkinin incelenmesi* (Master's thesis, Necmettin Erbakan University Institute of Educational Sciences). Konya.

Atasoy, M., & Altun, M. (2018). Measuring cognitive behavioural physical activity levels of students aged 17-18. *Journal of Education and Learning, 7*(6), 150-155.

Aydoğan, G. (2022). *Lise öğrencilerinin ebeveyn tutumları, sosyal destek düzeyleri ve okula ilişkin tutumları arasındaki ilişki: Kırklareli örneği* (Master's thesis, Istanbul University-Cerrahpasa Graduate School of Education). Istanbul.

Ayhan, C., Işık, O., & Kaçay, Z. (2021). The relationship between physical activity attitude and life satisfaction: A sample of university students in Turkey. *Work, 69*(3), 807-813. https://doi.org/10.3233/WOR-213513

Biddle, S. J. H., Ciaccioni, S., Thomas, G., & Vergeer, I. (2019). Physical activity and mental health in children and adolescents: A review of reviews. *Psychology of Sport and Exercise, 42,* 146-155. https://doi.org/10.1016/j.psychsport.2018.08.011

Birgün, A., Özen, E., Sevim Ugraş, B., & Sevim Pehlivan, B. (2020). Ortaokul öğrencilerinin fiziksel aktiviteye tutum düzeylerinin incelenmesi. *International Journal of Mountaineering and Climbing, 3*(2), 64-75.

Büyüköztürk, S. (2007). Sosyal bilimler için veri analizi el kitabı (7th ed.). Pegem Yayıncılık.

Çakır, E. (2019). Lise öğrencilerinin fiziksel aktiviteye katılım motivasyonları ile vücut kitle indeksi arasındaki ilişkinin incelenmesi. *Atatürk University Journal of Physical Education and Sport Sciences, 21*(1A), 30-39.

Caspersen, C. J., Pereira, M. A., & Curran, K. M. (2000). Changes in physical activity patterns in the United States, by sex and cross-sectional age. *Medicine and Science in Sports and Exercise, 32*(9), 1601-1609. https://doi.org/10.1097/00005768-200009000-00013

Cohen, S., & McKay, G. (2020). Social support, stress, and the buffering hypothesis: A theoretical analysis. *In Handbook of psychology and health*, 4, 253-267. Routledge.

Cunningham, M. R., & Barbee, A. P. (2000). Social support. In C. Hendrick & S. S. Hendrick (Eds.), *Closer relationships: A sourcebook*, 273-285. Sage Publications.

Doğaner, S. (2019). Kamu ve özel sektör çalışanlarının fiziksel aktiviteye katılmaya yönelik tutumlarının incelenmesi. *Journal of Sport Sciences Research*, *4*(2), 155-166.

Eker, D., & Arkar, H. (1995a). Çok boyutlu algılanan sosyal destek ölçeğinin faktör yapısı, geçerlik ve güvenirliği. *Social Psychiatry and Psychiatric Epidemiology, 30,* 121-126.

Eker, D., Arkar, H., & Yaldız, H. (2001). Çok boyutlu algılanan sosyal destek ölçeğinin gözden geçirilmiş formunun faktör yapısı, geçerlik ve güvenirliği. *Turkish Journal of Psychiatry, 12*(1), 17-25.

Eskiler, E., Kücükibis, F., & Gülle, M. (2016a). Bilişsel davranışçı fiziksel aktivite ölçeği: Geçerlik ve güvenirlik çalışması. *Journal of Human Sciences, 13*(2), 2577-2587.

Eskiler, E., Küçükibiş, F., Gülle, M., & Soyer, F. (2016b). Orta dönem çocuk ergenlerde fiziksel aktiviteye yönelik tutumların sosyal pazarlama bağlamında değerlendirilmesi. *In Erpa International Congresses on Education 2016. Book of Proceedings*, 716-722.

Gill, M., Chan-Golston, A. M., Rice, L. N., Roth, S. E., Crespi, C. M., Cole, B. L., Koniak-Griffin, D., & Prelip, M. L. (2018). Correlates of social support and its association with physical activity among young adolescents. *Health Education & Behaviour, 45*(2), 207-216. https://doi.org/10.1177/1090198117714826

Gülbetekin, E., Güven, E., & Tuncel, O. (2021). Adolesanların dijital oyun bağımlılığı ile fiziksel aktivite tutum ve davranışlarını etkileyen faktörler. *Bağımlılık Dergisi, 22*(2), 148-160. https://doi.org/10.51982/bagimli.866578

Gümüş, H., Honca, A. A., & Çetinkaya, T. (2019). Perceived social support in recreational activity participation: A study on students. *Higher Education Studies, 9*(1), 151-158. https://doi.org/10.5539/hes.v9n1p151

Haidar, A., Ranjit, N., Archer, N., & Hoelscher, D. M. (2019). Parental and peer social support is associated with healthier physical activity behaviours in adolescents: A cross-sectional analysis of Texas School Physical Activity and Nutrition (TX SPAN) data. *BMC Public Health, 19*(1), 1-9. https://doi.org/10.1186/s12889-019-7001-0

Hazar, Z., Tekkurşun Demir, G., Namlı, S., & Türkeli, A. (2017). Ortaokul öğrencilerinin dijital oyun bağımlılığı ve fiziksel aktivite düzeyleri arasındaki ilişkinin incelenmesi. *Niğde University Journal of Physical Education and Sport Sciences, 11*(3), 320-332.

Hilland, T. A., Ridgers, N. D., Stratton, G., & Fairclough, S. J. (2011). Associations between selected demographic, biological, school environmental, and physical education-based correlates, and adolescent physical activity. *Pediatric Exercise Science, 23*(1), 61-71. https://doi.org/10.1123/pes.23.1.61

Hilland, T. A., Stratton, G., Vinson, D., & Fairclough, S. (2009). The physical education predisposition scale: Preliminary development and validation. *Journal of Sports Sciences, 27*(14), 1555-1563.

Hudson, S. (2000). The segmentation of potential tourists: Constraint differences between men and women. *Journal of Travel Research, 38*(4), 363-368. https://doi.org/10.1177/004728750003800404

Hurley, D., Swann, C., Allen, M. S., Okely, A. D., & Vella, S. A. (2017). The role of community sports clubs in adolescent mental health: The perspectives of adolescent males' parents. *Qualitative Research in Sport, Exercise and Health, 9*(3), 372-388. https://doi.org/10.1080/2159676X.2016.1275751

İlhan, A. (2018). *Lise öğrencilerinin sosyal destek ile fiziksel aktivite düzeyleri arasındaki ilişkinin incelenmesi* (Master's thesis, Batman University Institute of Social Sciences). Batman.

İlhan, A., & Taşkın, C. (2019). Lise öğrencilerinin sosyal destek ile fiziksel aktivite düzeylerini arasindaki ilişkinin incelenmesi. *Journal of Academic Social Research, 98*, 307-313. https://doi.org/10.29228/ASOS.36790

İlter, B. (2018). *Sigara ve alkol kullanan lise öğrencilerinin sosyal destek algısı: Gerede örneği. Yüksek Lisans Tezi* (Master's thesis, Hacettepe University Institute of Social Sciences). Ankara.

Karasar, N. (2008). *Bilimsel araştırma yöntemi*. Nobel Yayınları.

Kastrati, A., & Georgiev, G. (2020). Factors associated with physical activity. *Sport Mont.*, *18*(1), 75-80. https://doi.org/10.1186/s13643-023-02226-0

Khan, S. R., Uddin, R., Mandic, S., & Khan, A. (2020). Parental and peer support are associated with physical activity in adolescents: Evidence from 74 countries. *International Journal of Environmental Research and Public Health, 17*(12), 4435. https://doi.org/10.3390/ijerph17124435

Küçükibiş, H. F. (2016). *Rol model alma davranışlarının ve fiziksel aktivite tutumlarının ders seçimleri üzerine etkisi* (Doctoral dissertation, Sakarya University Institute of Educational Sciences). Sakarya.

Küçükibiş, H. F., & Eskiler, E. (2019 Fiziksel aktivitelerde sosyal destek ölçeği (FASDÖ): Türkçeye uyarlama, geçerlilik ve güvenirlilik çalışması. *Sivas Cumhuriyet University Journal of Economics and Administrative Sciences*, *20*(2), 117-127.

Lindsay-Smith, G., Banting, L., Eime, R., O'Sullivan, G., & Van Uffelen, J. G. (2017). The association between social support and physical activity in older adults: A systematic review. *International Journal of Behavioural Nutrition and Physical Activity, 14*(1), 1-21. https://doi.org/10.1186/s12966-017-0509-8

Loh, V. H., Veitch, J., Salmon, J., Cerin, E., Thornton, L., Mavoa, S., & Timperio, A. (2019). Built environment and physical activity among adolescents: The moderating effects of neighbourhood safety and social support. *International Journal of Behavioural Nutrition and Physical Activity, 16*(1), 132. https://doi.org/10.1186/s12966-019-0898-y

Matton, L., Thomis, M., Wijndaele, K., et al. (2006). Tracking of physical fitness and physical activity from youth to adulthood in females. *Medicine and Science in Sports and Exercise, 38*(6), 1114-1120. https://doi.org/10.1249/01.mss.0000222840.58767.40

Mendonça, G., Cheng, L. A., Melo, E. N. N., & Junior, J. C. D. F. (2014). Physical activity and social support in adolescents: A systematic review. *Health Education Research, 29*(5), 822-839. https://doi.org/10.1093/her/cyu017

Menglong, L., & Ren, Y. (2024). Relationship among physical exercise, social support, and sense of coherence in rural left-behind children. *Journal of Psychiatric Research, 169*, 1-6. https://doi.org/10.1016/j.jpsychires.2023.11.010

Mermer, E. (2023). *Lise öğrencilerinde bilişsel esneklik ve algılanan sosyal desteğin mutlulukla ilişkisinin incelenmesi* (Master's thesis Ataturk University Institute of Educational Sciences). Erzurum.

Mullen, S. P., & Whaley, D. E. (2010). Age, gender, and fitness club membership: Factors related to initial involvement and sustained participation. *International Journal of Sport and Exercise Psychology, 8*(1), 24-35.

Neill, R. D., Lloyd, K., Best, P., & Tully, M. A. (2020). The effects of interventions containing physical activity components on adolescent mental health: A systematic review and meta-analysis. *Mental Health and Physical Activity, 19*, Article 100359. https://doi.org/10.1016/j.mhpa.2020.100359

Oosterhoff, B., Kaplow, J. B., Wray-Lake, L., & Gallagher, K. (2017). Activity-specific pathways between organized activity participation, social support, and adolescent well-being: Findings from a nationally representative sample. *Journal of Adolescence, 60*, 83-93. https://doi.org/10.1016/j.adolescence.2017.07.012

Opstoel, K., Chapelle, L., Prins, F. J., De Meester, A., Haerens, L., Van Tartwijk, J., & De Martelaer, K. (2020). Personal and social development in physical education and sports: A review study. *European Physical Education Review, 26*(4), 797-813. https://doi.org/10.1177/1356336X19882054

Orman, Y. (2016). *Lise öğrencilerinde algılanan sosyal destek ile psikolojik dayanıklılık arasındaki ilişkinin incelenmesi: Başakşehir örneği. Yüksek Lisans Tezi* (Master's thesis, Nisantasi University Institute of Social Sciences). Istanbul.

Özhan, M. B., & Yüksel, G. (2022). The effect of school burnout on academic achievement and well-being in high school students: A holistic model proposal. *International Journal of Contemporary Educational Research, 8*(1), 145-162. https://doi.org/10.33200/ijcer.824488

Parlar, F. (2019). *Ortaokul öğrencilerinin beden eğitimi yatkınlıkları ile sosyal beceri düzeyleri arasındaki ilişki. Yüksek Lisans Tezi* (Master's thesis, Karadeniz Technical University Institute of Educational Sciences). Trabzon.

Prochaska, J. J., Rodgers, M. W., & Sallis, J. F. (2002). Association of parent and peer support with adolescent physical activity. *Research Quarterly for Exercise and Sport, 73*(2), 206-210. https://doi.org/10.1080/02701367.2002.10609010

Reimers, A. K., Schmidt, S. C. E., Demetriou, Y., Marzi, I., & Woll, A. (2019). Parental and peer support and modeling in relation to domain-specific physical activity participation in boys and girls from Germany. *Plos One, 14*(10), e0223928. https://doi.org/10.1371/journal.pone.0223928

Ren, Z., Hu, L., Yu, J. J., Yu, Q., Chen, S., Ma, Y., Lin, J., Yang, L., Li, X., & Zou, L. (2020). The effect of social support on physical activity in Chinese adolescents: The mediating role of exercise self-efficacy. *Children, 7*(3), 23. https://doi.org/10.3390/children7030023

Sallis, J. F. (2000). Age-related decline in physical activity: A synthesis of human and animal studies. *Medicine and Science in Sports and Exercise, 32*(9), 1598-1600. https://doi.org/10.1097/00005768-200009000-00012

Sarah, A. (2011). Adolescent development: Social support and semantic expressions. *Journal of Psychology, 12*(3), 45-58.

Sarvan Cengiz, S., Örcütaş, H., Ulaş, A. G., & Ateş, B. (2022). Sedanter bireylerin yeme bozukluğu, beden algısı ile fiziksel aktiviteye karşı tutum ve davranışlarının belirlenmesi. *International Journal of Contemporary Educational Studies (IntJCES), 8*(1), 198-214.

Satman, M. C. (2018). Physical activity: Beyond the known. *Spormetre Journal of Physical Education and Sport Sciences, 16*(4), 158-178. https://doi.org/10.1501/Sporm_0000000401

Scarapicchia, T. M. F., Amireault, S., Faulkner, G., & Sabiston, C. M. (2017). Social support and physical activity participation among healthy adults: A systematic review of prospective studies. *International Review of Sport and Exercise Psychology, 10*(1), 50-83. https://doi.org/10.1080/1750984X.2016.1183222

Scarapicchia, T. M. F., Sabiston, C. M., Pila, E., Arbour-Nikolopoulos, K. P., & Faulkner, G. (2017). A longitudinal study of a multidimensional model of social support and physical activity during the first year of university. *Journal of Sport and Exercise Psychology, 31,* 11-20. https://doi.org/10.1016/j.psychsport.2017.03.011

Schembre, S. M., Durand, C. P., Blissmer, B. J., & Greene, G. W. (2015). Development and validation of the cognitive behavioural physical activity questionnaire. *American Journal of Health Promotion, 30*(1), 58-65.

Sheikh, M., Bay, N., Ghorbani, S., & Esfahani Nia, A. (2022). The effects of social support and physical self-efficacy on adolescents' physical activity. *International Journal of Paediatrics, 10*(4), 15823-15834. https://doi.org/10.22038/IJP.2022.62762.4793

Shen, B., Centeio, E., Garn, A., Martin, J., Kulik, N., Somers, C., & McCaughtry, N. (2018). Parental social support, perceived competence, and enjoyment in school physical activity. *Journal of Sport and Health Science, 7*(3), 346-352. https://doi.org/10.1016/j.jshs.2016.01.003

Shennar-Golan, V., & Walter, O. (2018). Physical activity intensity among adolescents and association with parent-adolescent relationship and well-being. *American Journal of Men's Health, 12*(5), 1530-1540. https://doi.org/10.1177/1557988318768600

Singh, R. K. C., & Devi, K. S. (2013). Attitude of higher secondary level students towards games and sports. *International Journal of Physical Education, Fitness and Sports*, *2*(4), 80-85. https://doi.org/10.26524/13421

Smith, A. L. (2003). Peer relationships in physical activity contexts: A road less travelled in youth sport and exercise psychology research. *Psychology of Sport and Exercise, 4*(1), *25-39.* https://doi.org/10.1016/S1469-0292(02)00015-8

Sorias, E. O. (1988). The concept of social support. *Ege University Medical Faculty Journal*, *27*(1), 353-357.

Taymoori, P., Niknami, S., Berry, T., Ghofranipour, F., & Kazemnejad, A. (2009). Application of the health promotion model to predict exercise behaviour stages in Iranian adolescents. *Eastern Mediterranean Health Journal, 15*(5), 1215-1225.

Telama, R., & Yang, X. (2000). Decline of physical activity from youth to young adulthood in Finland. *Medicine and Science in Sports and Exercise*, 32(9), 1617-1622. https://doi.org/10.1097/00005768-200009000-00015

Tokmak, N. N. (2022). *Fizyoterapi öğrencilerinin iyilik hali, fiziksel aktivite seviyesi, sedanter davranış seviyesi, fiziksel aktiviteye karşı tutum ve davranış düzeylerinin belirlenmesi* (Master's thesis, Dokuz Eylül University Institute of Health Sciences). Izmir.

Tomik, R., Olex-Zarychta, D., & Mynarski, W. (2012). Social values of sport participation and their significance for youth attitudes towards physical education and sport. *Studies in Physical Culture and Tourism, 19*(2), 99-104.

Ünlü, C. (2010). *Lise öğrencilerinde fiziksel inaktivite ve beden ölçüt düzeyleri ile öğrenim yılları arasındaki ilişki* (Master's thesis, Dokuz Eylül University Institute of Health Sciences). İzmir.

Vazquez, C., & Schuler, B. (2020). Adolescent physical activity disparities by parent nativity status: The role of social support, family structure, and economic hardship. *Journal of Racial and Ethnic Health Disparities, 7*, 1079–1089. https://doi.org/10.1007/s40615-020-00731-9

Vietze, D. L. (2011). Social support. In B. B. Brown & M. J. Prinstein (Eds.), *Encyclopedia of adolescence, 2*, 341-351. Academic Press.

Wilk, P., Clark, A. F., Maltby, A., Tucker, P., & Gilliland, J. A. (2018). Exploring the effect of parental influence on children's physical activity: The mediating role of children's perceptions of parental support. *Preventive Medicine, 106*, 79-85. https://doi.org/10.1016/j.ypmed.2017.10.018

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52*, 30-41.

Zorba, E., & Saygın, Ö. (2009). *Fiziksel aktivite ve uygunluk.* İnceler Ofset.

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Investigation of The Effect of Psychological Adaptation Skills on Sleep Quality: A Study on Students of The Faculty of Sports Sciences

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Abstract

Adequate sleep is vital for individuals. Many factors affect sleep quality. Some of these factors are expressed as depression, anxiety, and stress. The impact of depression, anxiety, and stress on sleep quality is an important issue that needs to be revealed. Therefore, this study aimed to investigate the effect of psychological adaptation skills of Ataturk University and Erzurum Technical University sports sciences faculty students on sleep quality. A total of 358 students, 119 female and 239 male, studying at sports science faculties constitute the sample group. Three parts were used in the data collection process: demographic information form, sleep quality scale, and DAS-21 scale. The relational screening model was used in the research. Findings show that as participants' depression, anxiety, and stress levels increase, their sleep quality scores also increase. Correlation and multiple regression analyses were used in the study. As a result of the correlation and multiple regression analysis, it is seen that psychological adaptation skills positively predict sleep quality. As participants' sleep quality levels increase, their psychological adaptation skills increase.
Keywords: Sleep quality, Depression, Anxiety, Stress

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INTRODUCTION

Sleep is considered a qualitative health variable and provides the individual's quality of life and well-being. Sleep allows the body to rest, strengthens the brain, and allows the person to prepare for the day by correcting and repairing it, while a change in the quality of Sleep causes daily life activities. A person is a whole person with physical, mental, social, intellectual, and spiritual aspects. For a person to be healthy, they need to meet these needs in a balanced way. When the sleep literature is examined, it is seen that there are many terminologies related to its definition. In its simplest definition, Sleep is the existence of all living things and the food of the brain. According to a standard view, Sleep is a state that cannot be awakened by appropriate emotional or various stimuli (Khorshid, 1996). In general, Sleep refers to a state in which the organism loses communication with its environment by recycling intense, temporary, fragmented, and periodic stimuli at various levels (Papilla & Acıoğlu, 2004). Adequate sleep is as vital as eating and breathing, and insufficient sleep causes deterioration in our physical and mental health (Nsengimana et al., 2023).

Sleep quality represents an individual's satisfaction with all aspects of their sleep experience (Nelson et al., 2022). This concept includes sleep efficiency, latency to sleep onset, duration, and number of awakenings after sleep onset. For adults, 7 to 8 hours of uninterrupted sleep is considered a 'good night's sleep.' Individuals who do not get enough sleep have a higher risk of developing stress, anxiety, and depression (Zou et al., 2020). Lack of sleep can cause fatigue, difficulty concentrating, and impaired cognitive functions (Dyrbye et al., 2014). Research has shown that sleep increases working memory capacity and memory consolidation. A meta-analysis of seventy studies concluded that acute sleep deprivation negatively impacts cognitive domains, including simple and complex attention, working memory, and short-term memory (Alotaibi et al., 2020).

Sleep disturbance is associated with psychological, behavioral, physiological, and environmental factors (Wang et al., 2020). According to the cognitive model of insomnia, negative emotions (mainly depression and anxiety) can trigger people's cognitive biases regarding stressful life events, making them hypervigilant and gradually affecting sleep quality. Stress is a high-risk factor for sleep quality because it affects sleep patterns. Stress disrupts sleep rhythm (low wave and rapid eye movement phases) by reducing sleep efficiency and increasing alertness (Kim & Dimsdale, 2007). Additionally, acute and chronic stress reactions affect cortisol secretion via the hypothalamic-pituitary-adrenal (HPA) axis, further influencing changes in circadian rhythms and sleep quality (Russell & Lightman, 2019). Sleep disorders, as included in Hamilton's severity rating scales, commonly accompany anxiety disorders and depressive illnesses (Hamilton, 1967).

While anxiety states represent an acute response to stress, depression can develop insidiously when stress lasts for a long time, so stress and insomnia are viewed as causally related (Wheatley, 1993). While anxiety causes depression and sleep disturbance are common accompaniments of both, lack

of sleep creates more stress (Mendelson et al., 1984). The immune system may be weakened by insomnia, stressful life events, and depression. The function of sleep is restorative, and when disrupted, physiological and psychological effects can occur (Adam & Oswald, 1983). Insomnia is often caused by stress, and continued lack of sleep further inhibits this stress-coping response. Sleep disturbance is a prominent feature of both anxiety and depression, as shown in a recent study by the Stress Clinic (Wheatley, 1993).

Psychological adjustment is a set of internal psychological outcomes such as depression, anxiety, and stress, which include having a clear sense of individual and cultural identity, good mental health, and satisfaction in the new environment (Searle & Ward, 1990). There is an essential relationship between psychological adjustment skills such as depression, anxiety, stress, and sleep (Kim & Dimsdale, 2007). Psychological adjustment skills such as depression, anxiety, and stress hurt the quality of sleep of individuals as they lead to prolonged sleep latency, waking up very early in the morning, frequent interruptions in night sleep, and, as a result, shortening of sleep duration (Gulec et al., 2012). The amount of sleep needed varies according to age, physical activity, and other factors. The amount of sleep that athletes need each night is considered at least 7 hours, but this figure varies from athlete to athlete. Athletes, compared to non-athletes, require more sleep volume for adequate recovery as a result of their high-intensity training (Marshall & Turner, 2016). However, it is recommended that young athletes who engage in high-intensity training sleep at least 10 hours per night (Calder, 2003). It has been reported that athletes will perform at their best when their general sleep and sleep habits are at optimal levels (Mah et al., 2011). Elite athletes have lower sleep quality than non-elite athletes (Leeder et al., 2012), individual athletes have more sleep problems than team athletes, and sleep disturbances are quite common the day before the competition (Leeder et al., 2012; Walsh et al., 2021). It is known that participation in sports prevents the onset of psychological adaptation skills such as depression, anxiety, and stress disorders (Bantjes & Swartz, 2018). Sports have been reported to positively affect stress, psychological states, fatigue, sleep, and health status (Moses et al., 1989).

Sports science faculty students are exposed to stressful situations during their education due to courses, training, and competitions that require long hours of physical and mental effort, which can lead to a wide range of mental health problems, including anxiety, depression, and post-traumatic stress disorder (PTSD). Mental health disorders and related symptoms are common in individuals involved in sports of all ages and professional levels (Gouttebarge et al., 2019). A recent meta-analysis study found that 26% of current elite athletes had significant stress/distress, 26% had sleep disturbance, and 34% had anxiety and depression (Gouttebarge et al., 2019). Additionally, extreme sleep disturbance has been associated with increased depression in NCAA student-athletes and adolescent athletes in football (Gomes et al., 2017). While it is empirically unclear whether athletes experience more mental health problems than the general population, athletes are vulnerable to acute and chronic stressors (e.g., pressures of competition leading to long-term injury) and other unique factors. This may put them at risk for developing mental health

disorders (e.g., major depressive disorder) or worsening of existing mental health symptoms (e.g., sleep disturbance and anxiety).

Sleep quality is considered very important for students who are exposed to depression, anxiety, and stress due to long-term theoretical and practical training, training, and competitions that require intense physical and mental effort. For this reason, psychological adaptation skills should be screened in sports sciences faculty students, and the effect of sleep quality on psychological adaptation skills should be investigated. This study aimed to examine the effect of psychological adaptation skills of sports sciences faculty students on sleep quality. Hypothesis: The working hypothesis is that sleep quality has a negative effect on psychological adaptation skills. It is thought that as the sleep quality levels of the participants decrease, their psychological adaptation skills will increase.

METHOD

Research Model

A relational screening model was used in the research. Relational screening model; "It is a research model that aims to jointly determine the existence or change between two or more variables" (Fraenkel et al., 1993).

Research Group

The research population comprises students from the sports science faculties. The sample group consists of students studying at the Faculty of Sports Sciences of Atatürk University and Erzurum Technical University. A total of 358 students participated in the research. The participants are 239 men and 119 women. Among the participants, 159 are in the first grade, 78 in the second, 50 in the third, and 71 in the 4th grade. Participants were selected by random sampling method. The data collection process was carried out through measurement tools physically prepared for the participants. In this context, data was collected from a total of 358 students.

Data Collection Tools

In this research process, data collection tools with proven validity and reliability were used in line with the purposes of the research. Introductory information about these measurement tools is presented below.

Depression, Anxiety, Stress (DASS 21) Scale: The DASS 21 scale was used to determine the depression, anxiety, and stress levels of sports sciences faculty students. This scale is a measurement tool used to determine the depression, anxiety, and stress levels of participants. The short form of the scale was developed by Henry and Crawford (2005). The reliability and validity study of the short form was conducted by Yılmaz et al. (2017). DASS 21 consists of a total of 21 items: depression (7), anxiety (7) and stress (7). The Cronbach's Alpha (α) value for the depression

dimension of the scale was found to be .819, the Cronbach's Alpha (α) value for the anxiety dimension was found to be .808 and the Cronbach's Alpha (α) value for the stress dimension was found to be .755. In this study, the Cronbach's Alpha (α) value for the depression dimension of the scale was found to be .931, the Cronbach's Alpha (α) value for the anxiety dimension was found to be .898 and the Cronbach's Alpha (α) value for the stress dimension was found to be .830.

Pittsburgh Sleep Quality Index (PSQI): PSQI Busee et al. (1989), and its Turkish validity and reliability study conducted by Ağargün et al. (1996), is a measurement tool that evaluates sleep quality over one month. In the PSQI evaluation, 18 items are included in the scoring. PSQI consists of 7 components: subjective sleep quality, latency, duration, habitual sleep efficiency, sleep disturbance, use of sleeping pills, and daytime dysfunction. Each item is evaluated between 0-3 points. A total score between 0-21 is obtained from 7 components. A total PSQI score of ≤5 indicates "good sleep quality," and a score >5 indicates "poor sleep quality." In the development of the sleep quality scale, the increase in the sleep quality scores of the participants indicates that they have poor sleep quality. Cronbach Alpha (α) value was determined as 0.80 (Ağargün et al., 1996). In this study, the Cronbach Alpha (α) value of the scale was determined as 0.89.

Ethical Approval

Ethics committee approval was received by the "Ataturk University Rectorate, Faculty of Sports Sciences Deanship" with the decision numbered E-70400699-000-2400210446 dated 01/07/2024-61.

Collection of Data

The research process started with approval from the Atatürk University Faculty of Sports Sciences Ethics Committee for the research suitability. Data were collected using physical tools. Physically prepared tools were filled out face to face by students at Atatürk University and Erzurum Technical University Faculties of Sports Sciences. A random sampling method was used in the data collection process, and an attempt was made to reach many students in the sports sciences faculty. Voluntariness was taken as the basis for participation in the research. Explanations were made that there was no personal information about the participants in the data collection tools, that the information regarding their opinions would be confidential, and that they could give up filling out the data collection tools at any time.

Analysis of Data

G*Power analysis, which is frequently used in sample selection in the field of social sciences, and methods of reaching at least 10 times the number of participants as the scale items used in the research were used (Akgül, 2005). When the number of items was taken as a basis, it was revealed that 300 participants, ten times the number of 30 items, was sufficient for the research. It was seen that 358 students reached through random sampling were sufficient for the conduct of the research. Correlation and regression analyses were conducted with SPSS software.

FINDINGS

Table 1. Correlation results between participants' depression, anxiety, stress and sleep quality

		1	2	3	4
	r	1			
1- Depression	p	-			
	n	358			
	r	.551**	1		
2- Anxiety	p	.000	-		
	n	358	358		
	r	.581**	.550**	1	
3- Stress	p	.000	.000	-	
	n	358	358	330	
	r	.462**	.381**	.336**	1
4- Sleep Quality	p	.000	.000	.000	-
	n	358	358	358	358

n=358, **p<0.001

When Table 1 is examined, it can be seen that there is a positive moderate difference between the participants' depression levels and anxiety levels (r= .551, p<.05), a positive moderate difference between the depression levels and stress levels (r= .581, p<.05). There was a positive moderate level between anxiety levels and stress levels (r= .550, p<.05), a positive moderate level between depression levels and sleep quality (r= .462, p<.05), a positive moderate level between anxiety levels and sleep quality (r = .381, p<.05) and a positive, moderately significant relationship between stress levels and sleep quality (r= .336, p<.05).

Table 2. Levels of variables predicting sleep quality level

R	R^2	Corrected R^2	Pre. Std. error
.488	.238	.231	2.011

As a result, it was seen that these variables explained 23.8% of the total variance in sleep quality.

Table 3. B and beta correlation coefficients and significance levels of variables

Predictors	B	Std. error	β	t	p
(Constant)	5.473	.298		18.381	.000
Depression	1.201	.184	.362	6.522	.000
Anxiety	.655	.200	.182	3.270	.001

When Table 2 and Table 3 were examined, it was determined to what extent depression and anxiety variables predicted sleep quality by applying linear multiple regression, and as a result of this process, R = .488, R2 = .238. As a result, it was seen that these variables explained 23.8% of the total variance in sleep quality. As a result of the analysis, it was determined that the effect size was high. Stepwise regression was used to determine the independent variables that significantly contributed to the prediction of sleep quality and the contribution of these independent variables to the total variance explained in the prediction of sleep quality. The results are shown in Tables 4 and 5.

Table 4. Stepwise regression analysis results on sleep quality

Model	R	R^2	Corrected R^2	Pre. Std. Error
1	.462	.214	.212	2.036
2	.487	.238	.232	2.009

Table 5. B and beta correlation coefficients and significance levels of variables

Model	Predictors	B	Std. Error	β	t	p
1	(Constant)	5.967	.260		22.941	.000
	Depression	1.532	.156	.462	9.838	.000
2	(Constant)	5.473	.298		18.381	.000
	Depression	1.201	.184	.362	6.522	.000
	Anxiety	.655	.200	.182	3.270	.001

When Table 4 is examined, the depression regression equation is entered, and it is seen that 21.4% of the variance in sleep quality is explained by the depression variable (R=.462, R2=.214). In other words, the depression variable is the strongest predictor of the sleep quality variable. The positive (+) beta value direction shows that there is a positive relationship between depression and sleep quality; increasing sleep quality scores also causes an increase in depression scores. After the depression variable, the anxiety variable is added to the model, and with the addition of this variable to the model, the explained variance in sleep quality score increased from 21.4% to 23.7% (R=.487, R2=.237). In other words, the anxiety variable contributes approximately 23.7% to the explained variance.

When Table 5 is examined, the Beta value of the anxiety variable (.182) shows that the relationship between anxiety and sleep quality is positive, and the sleep quality score increases as the anxiety score increases. The independent variable stress was removed from the model because it did not significantly predict the level of sleep quality.

DISCUSSION AND CONCLUSION

All levels of sports education leave individuals alone with intense physical and mental effort. These long-term training and the physical and mental efforts that must be given due to the nature of sports cause individuals to be exposed to psychological adaptation skills such as depression, anxiety, and stress. This situation is considered very important in terms of individuals' sleep quality. Therefore, it is necessary to screen psychological adaptation skills and sleep quality levels in sports science faculties where sports education is provided and to examine the effect of sleep quality on psychological adaptation skills. This study examined "the effect of psychological adaptation skill levels of sports science faculty students on sleep quality." It was determined that there was a positive relationship between the depression, anxiety, and stress levels of the participants and their sleep quality levels. In the development of the sleep quality scale, the

increase in the sleep quality scores of the participants indicates that they have a poor level of sleep quality. Therefore, the positive relationship between sleep quality and depression, anxiety, and stress levels suggests that depression, anxiety, and stress levels increase as the sleep quality score increases. In the study, it was seen that the independent variables (depression and anxiety) predicted 23.7% of the total variance of sleep quality, which was determined as the dependent variable. It was determined that the variables depression and anxiety made the most significant contribution to the total variance, respectively. The independent variable stress was removed from the model because it did not significantly predict the level of sleep quality.

When the study findings are examined, it is seen that there is a positive relationship between the participants' sleep quality levels and psychological adaptation skills. An increase in the participants' sleep quality levels (increased scores from sleep quality levels indicate that they have poor sleep quality) decreases their psychological adaptation skill levels. When the literature is examined, Anshel and Anderson (2002) stated in their study on athletes that they are generally more successful in coping with negativity, more effective in regulating emotions, and probably effectively learn how to deal with distracting stress factors. Factors such as sleep problems, depression, anxiety, and stress seen in athletes cause decreases in self-esteem and decreased performance (Nixdorf, 2018). Sleep quality is very important for athletes in order to protect themselves from psychological adaptation skills such as depression, anxiety, and stress. Işık et al. (2015) stated in their study that sleep quality has a significant effect on physical activity level and depression score averages. Roveda et al. (2011) stated that exercise increases sleep quality and duration. Faria et al. (2009) It was stated that endurance exercises on sedentary individuals were effective on sleep quality parameters and positively affected sleep. In the study conducted by King et al. (1997), it was reported that exercise activity increased sleep quality. In light of these results, it can be said that physical activity has a decisive effect on sleep quality. Studies have shown that people who do sports can have better quality and longer sleep duration than sedentary people (Fullagar et al., 2015). Insomnia causes factors such as depression, anxiety and stress in athletes (Bonnet, 1985). It has been observed that three hours of physical activity per week helps prevent the onset of negative emotional states such as depression, anxiety and stress (Windt et al., 2015). In the study conducted by Yüceant (2023), it was concluded that depression, anxiety and stress levels decreased after the participants were made to do physical activity. In the study conducted by Yüceant (2022) on tennis players, it was concluded that there was a negative correlation between the depression, anxiety and stress levels of individuals who played tennis regularly and their psychological well-being. These results show that sports reduce psychological adaptation skills such as depression, anxiety and stress and help increase well-being levels (Borland et al., 2022).

Studies have reported that anxiety and depression have a clinically significant effect on sleep quality during the pandemic in adults (Batool-Anwar et al., 2023). Depression symptoms have been shown to reduce sleep quality in medical students (Li et al., 2020). Emotional states can negatively impact sleep quality, and sleep problems can worsen mental health problems. Sleep

"disorders" are considered a correlate or risk factor as there are several mental health disorders, and more significant numbers and more severe sleep "disorders" are associated with higher levels of anxiety, stress, fatigue, pain intensity, and quality of life in athletes (Gomes et al., 2017). The relationship between stress, anxiety, depression, and poor sleep quality has been highlighted in several studies published among health students (Zhang et al., 2018). A study conducted among nursing students concluded that poor sleep quality is associated with symptoms of stress, depression, and anxiety. In their study on 284 medical faculty students, Mishra et al. (2022) found that stressed students had twice the poor sleep quality compared to those without stress (Mishra et al., 2022). Another study concluded that higher levels of perceived stress were significantly associated with poor sleep quality (Lee et al., 2022). In a study of 1,125 college students ages 17 to 24, more than 60% of participants were classified as poor sleepers. According to data obtained from students, it was concluded that anxiety and stress were significantly associated with sleep disorders (Lund et al., 2010). Another study states that high-stress levels are directly linked to poor sleep quality (Calderon Jr et al., 2021).

Research shows that individuals with psychiatric disorders such as anxiety and depression are three times more likely to have sleep problems than young people without psychiatric problems. Epidemiological studies examine the relationship between sleep problems (difficulty falling asleep and staying asleep) and depression in young individuals aged 21-30, revealing that sleep problems are seen at a rate of 50-60% in this age group (Dinis & Bragança, 2018). Additionally, it has been found that in people experiencing high levels of stress and anxiety, circadian and ultradian rhythms become out of sync, and sleep-wake cycles are disrupted due to increased cortisol levels due to neuroendocrine dysregulation. (Holsboer & Ising, 2010). In a comprehensive screening study conducted by Fernando et al. (2013), it was determined that 44.8% of students with sleep problems had anxiety and that there was a moderate relationship between sleep problems and anxiety. In parallel with this study, a moderate relationship was detected between sleep quality and anxiety in our research, and it was concluded that anxiety is a parameter that significantly affects sleep quality. In a study conducted by Latif et al. (2019) based on a healthy sample, it was observed that as emotional expression suppression and negative emotions increased, sleep quality measured by PSQI decreased. Similarly, sleep problems increase negative emotions (Bouwmans, 2017). Although there is no consensus on the relationship between negative emotions and sleep quality or sleep problems, as sleep efficiency decreases, significantly as amygdala activity increases, difficulties in regulating emotions and responding to stressful situations increase. This can be seen as a decrease in positive emotional symptoms and an increase in negative emotions in individuals. As a result, an increase in depressive symptoms and anxiety levels can be observed (Prather et al., 2013). In a study conducted by Babson et al. (2010) on sleep-deprived participants, it was found that state anxiety and depression scores were higher in the sleep-deprived group compared to the control group sleeping at average sleep time. It has been found that students with very high levels of depression have lower sleep quality, longer sleep duration, and more frequent night wakings compared to students with low levels of depression (Moo-Estrella et al., 2005). Another study in this area showed that in adults followed for 12 months, insomnia symptoms recorded at initial

measurements were associated with anxiety, depression, and generalized symptoms in subsequent months (Morphy et al., 2007). It has been stated that daily stress and negative emotions have an impact on sleep patterns and rest, and it has also been stated that disruptions in sleep quality are positively associated with depression and anxiety (Fidantek et al., 2022). In this context, it has been concluded that developing individuals' coping skills in coping with negative emotional states is necessary for sleep quality and mental health to maintain the sleep pattern that significantly affects the quality of life.

This study has some limitations. All participants in this study were recruited from the Eastern Anatolia Region. Whether different cultural backgrounds influence the result reported here needs further investigation. This study is only cross-sectional, and more experimental or interventional studies are needed to test its results. As a result, it was concluded that sleep quality positively affects psychological adaptation skills. It is observed that as the sleep quality levels of the participants increase, their psychological adaptation skill levels also increase. A high score obtained from sleep quality means that sleep quality is poor. It was concluded that poor sleep quality increases the psychological adaptation skill levels of the participants. Fidantek et al. (2022) showed that deteriorations in sleep quality are positively correlated with depression and anxiety. In this context, it was concluded that to maintain regular sleep, which is a factor that significantly affects the quality of life, the development of individuals' coping skills is of critical importance for the mental health of individuals. Studies can be conducted on different sample groups to reveal the relationship between sleep quality and psychological adaptation skills. Studies can be undertaken to demonstrate the effect of sleep quality on various dependent variables. Studies can be conducted to reveal the importance of the relationship between sleep and psychological adaptation skills among participants who do active sports and those who live a sedentary life.

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REFERENCES

Adam, K., & Oswald, I. (1983). Protein synthesis, bodily renewal and the sleep-wake cycle. *Clinical Science, 65*(6), 561-567.

Ağargün, M. Y., Kara, H., & Anlar, Ö. (1996). Validity and reliability of the Pittsburgh sleep quality index. *Turkish Journal of Psychiatry, 7*(2), 107-115.

Akgül, A. (2005). *Statistical analysis techniques in medical research "SPSS applications. (2nd Edition)*. Emek Offset.

Alotaibi, A. D., Alosaimi, F. M., Alajlan, A. A., & Abdulrahman, K. A. B. (2020). The relationship between sleep quality, stress, and academic performance among medical students. *Journal of Family and Community Medicine, 27*(1), 23-28. https://doi.org/10.4103/jfcm.JFCM_132_19

Anshel, M., & Anderson, D. (2002). Coping with acute stress in sport: Linking athletes' coping style, coping strategies, affect, and motor performance. *Anxiety, Stress & Coping, 15*(2), 193-209. https://doi.org/10.1080/10615800290028486

Babson, K. A., Trainor, C. D., Feldner, M. T., & Blumenthal, H. (2010). A test of the effects of acute sleep deprivation on general and specific self-reported anxiety and depressive symptoms: an experimental extension. *Journal of Behavior Therapy and Experimental Psychiatry, 41*(3), 297-303. https://doi.org/10.1016/j.jbtep.2010.02.008

Bantjes, J., & Swartz, L. (2018). Social inclusion through para sport: a critical reflection on the current state of play. *Physical Medicine and Rehabilitation Clinics, 29*(2), 409-416.

Batool-Anwar, S., Robbins, R., Ali, S. H., Capasso, A., Foreman, J., Jones, A. M., & Quan, S. F. (2023). Examining changes in sleep duration associated with the onset of the COVID-19 pandemic: Who is sleeping and who is not? *Behavioral Medicine, 49*(2), 162-171. https://doi.org/10.1080/08964289.2021.2002800

Bonnet, M. H. (1985). Effect of sleep disruption on sleep, performance, and mood. *Sleep, 8*(1), 11-19. https://doi.org/10.1093/sleep/8.1.11

Borland, R. L., Cameron, L. A., Tonge, B. J., & Gray, K. M. (2022). Effects of physical activity on behaviour and emotional problems, mental health and psychosocial well-being in children and adolescents with intellectual disability: A systematic review. *Journal of Applied Research in Intellectual Disabilities, 35*(2), 399-420. https://doi.org/10.1111/jar.12961

Bouwmans, M. E., Bos, E. H., Hoenders, H. R., Oldehinkel, A. J., & de Jonge, P. (2017). Sleep quality predicts positive and negative affect but not vice versa. An electronic diary study in depressed and healthy individuals. *Journal of Affective Disorders*, 207, 260-267. https://doi.org/10.1016/j.jad.2016.09.046

Buysee, D., J, Charles, F., Reynolds, C. F., Mak, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Res., 28*(2), 193-213. https://doi.org/10.1016/0165-1781(89)90047-4

Calder, A. (2003). Recovery strategies for sports performance. *USOC Olympic Coach E-Magazine, 15*(3), 8-11.

Karababa, B., Şeran., B., & Canyurt, F. (2025). Investigation of the effect of psychological adaptation skills on sleep quality: A study on students of the Faculty of Sports Sciences. *Eurasian Journal of Sport Sciences and Education, 7*(1), 44-58.

Calderon Jr, R., Pupanead, S., Prachakul, W., & Kim, G. (2021). Happiness, perceived stress, psychological well-being, and health behaviors of Thai university students: Preliminary results from a multinational study on well-being. *Journal of American College Health*, *69*(2), 176-184. https://doi.org/10.1080/07448481.2019.1657871

Dinis, J., & Bragança, M. (2018). Quality of sleep and depression in college students: a systematic review. *Sleep Science*, *11*(4), 290-301. https://doi.org/10.5935/1984-0063.20180045

Dyrbye, L. N., West, C. P., Satele, D., Boone, S., Tan, L., Sloan, J., & Shanafelt, T. D. (2014). Burnout among US medical students, residents, and early career physicians relative to the general US population. *Academic Medicine*, *89*(3), 443-451. https://doi.org/10.1097/ACM.0000000000000134

Faria, A. P., Cavagnolli, D. A., Rossi, M. V., Ferreira, S. E., Bittencourt, L. R. A., Tufik, S., & de Mello, M. T. (2009). Effects of resistance exercise on the sleep patterns of sedentary individuals. *Sleep Sci.*, *2*(3), 141-6.

Fernando, A., Samaranayake, C., Blank, C., Roberts, G., & Arroll, B. (2013). Sleep disorders among high school students in New Zealand. *Journal of Primary Health Care*, *5*(4), 276-282. https://doi.org/10.1071/HC13276

Fidantek, H., Yazıhan, N., & Tuna, E. (2022). The Mediating Role of Positive and Negative Affect in the Relationship between Sleep Quality and Depressive Symptoms and Anxiety in Young Adults. *Journal of Turkish Sleep Medicine*, *9*(2), 120-129. https://doi.org/10.4274/jtsm.galenos.2021.52244

Fraenkel, J., Wallen, N., & Hyun, H. (1993). *How to Design and Evaluate Research in Education 10th ed*. McGraw-Hill Education.

Fullagar, H. H., Skorski, S., Duffield, R., Hammes, D., Coutts, A. J., & Meyer, T. (2015). Sleep and athletic performance: the effects of sleep loss on exercise performance, and physiological and cognitive responses to exercise. *Sports Medicine*, *45*(2), 161-186. https://doi.org/10.1007/s40279-014-0260-0

Gomes, G. C., Passos, M. H. P. d., Silva, H. A., Oliveira, V. M. A. d., Novaes, W. A., Pitangui, A. C. R., & Araújo, R. C. d. (2017). Sleep quality and its association with psychological symptoms in adolescent athletes. *Revista Paulista de Pediatria*, *35*(3), 316-321. https://doi.org/10.1590/1984-0462/;2017;35;3;00009

Gouttebarge, V., Castaldelli-Maia, J. M., Gorczynski, P., Hainline, B., Hitchcock, M. E., Kerkhoffs, G. M., & Reardon, C. L. (2019). Occurrence of mental health symptoms and disorders in current and former elite athletes: a systematic review and meta-analysis. *British Journal of Sports Medicine*, *53*(11), 700-706. https://doi.org/10.1136/bjsports-2019-100671

Gulec, M., Ozcan, H., Oral, E., Selvi, Y., & Aydin, A. (2012). The relationship between insomnia and major depressive disorder: A chicken and egg situation?. *Psychiatry and Behavioral Sciences*, *2*(1), 28. https://doi.org/10.5455/jmood.20120208025502

Hamilton, M. (1967). Development of a rating scale for primary depressive illness. *British Journal of Social and Clinical Psychology*, *6*(4), 278-296. https://doi.org/10.1111/j.2044-8260.1967.tb00530.x

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology*, *44*(2), 227-239. https://doi.org/10.1348/014466505X29657

Holsboer, F., & Ising, M. (2010). Stress hormone regulation: biological role and translation into therapy. *Annual Review of Psychology*, *61*(1), 81-109. https://doi.org/10.1146/annurev.psych.093008.100321

Işık, Ö., Özarslan, A., & Bekler, F. (2015). Relationship between physical activity, sleep quality and depression in university students. *Journal of Physical Education and Sports Sciences*, *9*(9), 65-73.

Khorshıd, L. (1996). The importance of sleep and rest. *Ege Üniversitesi Hemşirelik Fakültesi Dergisi*, *12*(3), 133-140.

Kim, E.-J., & Dimsdale, J. E. (2007). The effect of psychosocial stress on sleep: A review of polysomnographic evidence. *Behavioral sleep medicine*, *5*(4), 256-278. https://doi.org/10.1080/15402000701557383

King, A. C., Oman, R. F., Brassington, G. S., Bliwise, D. L., & Haskell, W. L. (1997). Moderate-intensity exercise and self-rated quality of sleep in older adults: A randomized controlled trial. *Jama*, *277*(1), 32-37. https://doi.org/10.1001/jama.1997.03540250040029

Latif, I., Hughes, A. T., & Bendall, R. C. (2019). Positive and negative affect mediate the influences of a maladaptive emotion regulation strategy on sleep quality. *Frontiers in Psychiatry*, *10*, 628. https://doi.org/10.3389/fpsyt.2019.00628

Lee, H., Rauktis, M. E., & Fusco, R. A. (2022). Perceived stress and sleep quality among master's students in social work. *Social Work Education*, *41*(5), 1018-1034. https://doi.org/10.1080/02615479.2021.1910231

Leeder, J., Glaister, M., Pizzoferro, K., Dawson, J., & Pedlar, C. (2012). Sleep duration and quality in elite athletes measured using wristwatch actigraphy. *Journal of Sports Sciences*, *30*(6), 541-545. https://doi.org/10.1080/02640414.2012.660188

Li, W., Yin, J., Cai, X., Cheng, X., & Wang, Y. (2020). Association between sleep duration and quality and depressive symptoms among university students: A cross-sectional study. *PLoS One*, *15*(9), e0238811. https://doi.org/10.1371/journal.pone.0238811

Lund, H. G., Reider, B. D., Whiting, A. B., & Prichard, J. R. (2010). Sleep patterns and predictors of disturbed sleep in a large population of college students. *Journal of Adolescent Health*, *46*(2), 124-132. https://doi.org/10.1016/j.jadohealth.2009.06.016

Mah, C. D., Mah, K. E., Kezirian, E. J., & Dement, W. C. (2011). The effects of sleep extension on the athletic performance of collegiate basketball players. *Sleep*, *34*(7), 943-950. https://doi.org/10.5665/SLEEP.1132

Marshall & Turner, 2016). The importance of sleep for athletic performance. *Strength and Conditioning Journal, 38*(1), 61-67. https://doi.org/10.1519/SSC.0000000000000189

Mendelson, W. B., Garnett, D., Gillin, J. C., & Weingartner, H. (1984). The experience of insomnia and daytime and nightime functioning. *Psychiatry Research*, *12*(3), 235-250. https://doi.org/10.1016/0165-1781(84)90029-5

Mishra, J., Panigrahi, A., Samanta, P., Dash, K., Mahapatra, P., & Behera, M. R. (2022). Sleep quality and associated factors among undergraduate medical students during Covid-19 confinement. *Clinical Epidemiology and Global Health*, *15*, Article 101004. https://doi.org/10.1016/j.cegh.2022.101004

Karababa, B., Şeran., B., & Canyurt, F. (2025). Investigation of the effect of psychological adaptation skills on sleep quality: A study on students of the Faculty of Sports Sciences. *Eurasian Journal of Sport Sciences and Education, 7*(1), 44-58.

Moo-Estrella, J., Pérez-Benítez, H., Solís-Rodríguez, F., & Arankowsky-Sandoval, G. (2005). Evaluation of depressive symptoms and sleep alterations in college students. *Archives of medical research*, *36*(4), 393-398. https://doi.org/10.1016/j.arcmed.2005.03.018

Morphy, H., Dunn, K. M., Lewis, M., Boardman, H. F., & Croft, P. R. (2007). Epidemiology of insomnia: A longitudinal study in a UK population. *Sleep*, *30*(3), 274-280. https://doi.org/10.1093/sleep/30.3.274

Moses, J., Steptoe, A., Mathews, A., & Edwards, S. (1989). The effects of exercise training on mental well-being in the normal population: A controlled trial. *Journal of Psychosomatic Research*, *33*(1), 47-61. https://doi.org/10.1016/0022-3999(89)90105-0

Nelson, K. L., Davis, J. E., & Corbett, C. F. (2022). Sleep quality: An evolutionary concept analysis. *Nursing forum*, *57*(1), 144-151. https://doi.org/10.1111/nuf.12659

Nixdorf, R. (2018). *Depression and burnout in (junior) elite athletes: Reviewing the state of knowledge and analysing their relationship.* (PhD Thesis) Fakultät für Sport- und Gesundheitswissenschaften, Lehrstuhl für Sportpsychologie, pp. 69, 143-154.

Nsengimana, A., Mugabo, E., Niyonsenga, J., Hategekimana, J. C., Biracyaza, E., Mutarambirwa, R., & Nduwayezu, R. (2023). Sleep quality among undergraduate medical students in Rwanda: a comparative study. *Scientific Reports*, *13*(1), 265. https://doi.org/10.1038/s41598-023-27573-9

Papilla, İ., & Acıoğlu, E. (2004). Obstructive sleep apnea syndrome. *Hipokrat dergisi*, *13*(3), 87-91.

Prather, A. A., Bogdan, R., & Hariri, A. R. (2013). Impact of sleep quality on amygdala reactivity, negative affect, and perceived stress. *Psychosomatic Medicine*, *75*(4), 350-358. https://doi.org/10.1097/PSY.0b013e31828ef15b

Roveda, E., Montaruli, A., Calogiuri, G., Carandente, F., Sciolla, C., & Angeli, A. (2011). Effects of endurance and strength acute exercise on night sleep quality. *International SportMed Journal*, *12*(3), 113-124.

Russell, G., & Lightman, S. (2019). The human stress response. *Nature Reviews Endocrinology*, *15*(9), 525-534. https://doi.org/10.1038/s41574-019-0228-0

Searle, W. & Ward, C. (1990). The prediction of psychological and sociocultural adjustment during cross-cultural transitions. *International Journal of Intercultural Relations*, *14*(4), 449-464. https://doi.org/10.1016/0147-1767(90)90030-Z

Walsh, N. P., Halson, S. L., Sargent, C., Roach, G. D., Nédélec, M., Gupta, L., ... & Samuels, C. H. (2021). Sleep and the athlete: narrative review and 2021 expert consensus recommendations. *British Journal of Sports Medicine*, *55*(7), 356-368. https://doi.org/10.1136/bjsports-2020-102025

Wang, X.-D., Gao, Y.-S., Li, Q., Chen, Y.-C., & Li, W.-X. (2020). Analysis of the factors influencing sleep quality of university students in Hainan Province of China. *Biological Rhythm Research*, *51*(6), 963-970. https://doi.org/10.1080/09291016.2019.1566989

Wheatley, D. (1993). Sleep patterns in anxiety and depression associated with stress. *Stress Medicine*, *9*(2), 127-129. https://doi.org/10.1002/smi.2460090209

Karababa, B., Şeran., B., & Canyurt, F. (2025). Investigation of the effect of psychological adaptation skills on sleep quality: A study on students of the Faculty of Sports Sciences. *Eurasian Journal of Sport Sciences and Education, 7*(1), 44-58.

Windt, J., Windt, A., Davis, J., Petrella, R., & Khan, K. (2015). Can a 3-hour educational workshop and the provision of practical tools encourage family physicians to prescribe physical activity as medicine? A pre–post study. *BMJ Open*, *5*(7), e007920. https://doi.org/10.1136/bmjopen-2015-007920

Yılmaz, Ö., Boz, H., & Arslan, A. (2017). Validity-Reliability Study of the Turkish Short Form of the Depression Anxiety Stress Scale (Dass 21). *Journal of Finance, Economics and Social Research*, *2*(2), 78-91.

Yüceant, M. (2022). Investigation of Stress, Anxiety, Depression and Psychological Well-Being Levels of Individuals Who Regularly Play Tennis. *Education Quarterly Reviews*, *5*(2), 270-281.

Yüceant, M. (2023). Effects of regular physical activity on stress, anxiety, depression, life satisfaction, psychological well-being and positive-negative emotions. *Mediterranean Journal of Sports Sciences*, *6*(2), 581-598. https://doi.org/10.38021/asbid.1248186

Zhang, Y., Peters, A., & Chen, G. (2018). Perceived stress mediates the associations between sleep quality and symptoms of anxiety and depression among college nursing students. *International journal of nursing education scholarship*, *15*(1), 20170020. https://doi.org/10.1515/ijnes-2017-0020

Zou, P., Wang, X., Sun, L., Liu, K., Hou, G., Yang, W., & Zhang, G. (2020). Poorer sleep quality correlated with mental health problems in college students: A longitudinal observational study among 686 males. *Journal of psychosomatic research*, *136*, 110177. https://doi.org/10.1016/j.jpsychores.2020.110177

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Investigation of the Relationship Between Digital Addiction and Physical Activity Levels in Children and Adolescents*

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Abstract

The aim of this study is to investigate the relationship between digital addiction (DA) and physical activity (PA) levels in children and adolescents. The sample of this cross-sectional and descriptive study consists of 400 students, 267 girls, aged 8-17, in Izmir. The participants were administered the handgrip strength test, the PA Level Scale (QPAC-C), and the DA Level Scale, which have been validated and reliable in Turkish for children and adolescents. DA (55.7±15.8, M:3.52±0.62; F:3.40±0.56, p=0.200) and PA (3.44±0.58) and handgrip strength (23.9±9.82kg, M:25.3±13.2kg, F:23.2±7.58kg, p=0.525) were compared according to gender, and the results for men were higher than for women. The difference in PA level (M:3.52±0.62, F:3.40±0.56, p=0.020) between the genders was significant (Mann-Whitney U). DA and PA levels (p=0.325) and handgrip strength results were compared between ages (Kruskal Wallis), and it was found that handgrip strength and DA levels were significantly different between ages (One-Way ANOVA). There was a significant difference in hand grip strength between all ages except 9-10, 11-12, 14-15, 14-16, and 16-17 years old (Mann-Whitney U), and in DA between 8 and 11, 13, 15 and 16 years old (Bonferroni post hoc). A positive correlation was found between age and DA (r=0.252, p<0.001) and handgrip strength (r=0.822, p<0.001) (Spearman's Rank Coefficient). Society needs to be made aware of the need to reduce the DA level that increases with age and to create conditions that will increase the PA level. In future studies, it is recommended that biological, psychological, and socio-cultural factors be evaluated to determine age and gender differences.

Keywords: Child, Exercise, Screen addiction, Physical inactivity, Youth

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INTRODUCTION

Digital addiction (DA) can be defined as an addiction to spending more time than necessary on activities such as the internet, social media, online chat, and computer games, especially for entertainment purposes, through a technological device (Aziz et al., 2021). Digital addiction is a behavioral technology addiction fueled by a sense of incompleteness. The term digital addict is used to describe an individual who is so interested in technology that it has a negative effect on the public and an effect that creates continual action on the user (Rugai & Hamiliton-Ekeke, 2016).

On the other hand, the internet is a communication network where individuals can access the content they desire regardless of time and place (Langley & Hutt, 2022). In fact, children's balanced and appropriate use of communication networks such as the internet can be significantly effective in increasing their academic success and developing social competence and cognitive skills (Dresp-Langley, 2020). However, excessive computer and internet use can lead to social, mental, and physical problems (Sasmaz et al., 2014). Research suggests that excessive use of digital devices can adversely impact biological, psychological, and social development. This is particularly true for individuals at developmental ages, where unconscious and excessive technology use can lead to issues such as attention deficit, hyperactivity, and impulse control. (Yılmaz & Özkan, 2024). Young individuals are the most active users of mobile technologies. Frequently used smartphones can create habits, increase the likelihood of developing addictive behaviour, and lead to unwanted behaviours triggered by internal and external stimuli (Deursen et al., 2015). The age range is wide in digital addiction, where adolescent and adult groups experience related problems (Kuss et al., 2014). Physical activity (PA) and sports participation can prevent smartphone addiction in children and adolescents (Azam et al., 2020).

Physical activity is defined as activities that occur in life by using muscles and joints to expend energy, increase heart and respiratory rates, and result in different levels of fatigue depending on the type of PA. PA is very important for a healthy development process, participation in social life, and quality of life in children and adolescents (Baltacı, 2012). Physical activity offers numerous benefits for the physical and mental health of children and adolescents. From a psychological viewpoint, physical activity boosts children's self-confidence, enhances their self-esteem, and has a positive impact on their academic performance. It also contributes to their emotional well-being by alleviating symptoms of depression (Meydanlıoğlu, 2015). In contrast, excessive use of video games, television, or internet activities within digital activities leads to an increase in sedentary behaviors (Pop, 2015). Since children's physical development processes continue until adulthood, excessive use of smartphones, which are communication tools, during childhood and adolescence does not have a positive effect on children's physical development (Park & Park, 2014). Decreased physical activity during adolescence can lead to negative effects such as metabolic disorders, hormone imbalances, psychological and social difficulties, and growth and development problems (Eisenmann & Wickel, 2009). Increasing physical activity plays a vital role in the prevention and treatment of obesity (Eliacik et al., 2016). It helps strengthen muscles and bones while reducing

the risk of cardiovascular diseases, high blood pressure, Type II diabetes, and some types of cancer (Meydanlıoğlu, 2015).

The handgrip strength test is an effective tool for identifying potential problems that arise during children's developmental processes, in addition to its main purpose. Low handgrip strength, muscle weakness, or physical activity deficiencies can be determined at early stages. This supports the reduction of health-related risks with special exercise programs and interventions planned in accordance with the needs of children (Cohen et al., 2016). Physical activity has an important effect on increasing handgrip strength, which is one of the basic elements of physical fitness for children and adolescents. It has been shown that an increase in handgrip strength is observed in children who exercise regularly and that this increase is closely related to the development of muscle mass (Graves et al., 2010; Meşe-Yavuz & Başyiğit, 2023).

For these reasons, schools can play an important role by identifying children with low physical fitness and encouraging positive health behaviors such as being active, especially by emphasizing the intensity of activity. Childhood and adolescence are very important periods of life due to the dramatic physiological and psychological changes that occur. To help children in schools increase their PA levels, it will be important to increase societies' knowledge levels and conduct successful studies worldwide (Guthold et al., 2010).

Previous studies have shown that digital addiction has negative effects on children and adolescents. In this study, the relationship between DA and PA levels of children and adolescents between the ages of 8 and 17 will be investigated. The study hypotheses are that DA levels and hand grip strength will increase, while PA levels will decrease with children's age; PA levels and hand grip strength will differ between genders in children and adolescents; DA levels will not differ between genders; and children and adolescents with high DA levels will exhibit low PA levels and hand grip strength.

METHOD

Design and Participants

The study has a cross-sectional descriptive feature in a mixed-pattern relational model that includes quantitative and qualitative measurements. The sample of the research is a total of 400 participants, including 220 students registered and attending İzmir Bahçeşehir College Güzelbahçe Campus in the 2023-2024 academic year and 180 children in sports clubs doing infrastructure training in the İzmir province.

Data Collection and Tools

Participant Information Form: The researcher prepared an open-ended form. It consisted of questions regarding the participants' age, gender, height, mass, current grade, dominant hand,

possession of a mobile phone/tablet/laptop, and the duration of use of these devices during the day. It did not include any questions regarding the participants' identity information.

Physical Activity Level Scale: The Physical Activity Scale was validated and reliably studied by Erdim et al. (2019) for the age group 8-14, and Cronbach's $\alpha = 0.77$ was reported for the general sample and had an acceptable level of internal consistency. The scale consists of 10 questions.
The validity and reliability of the Physical Activity Scale for the 14-18 age groups was evaluated by Polat (2017). Test-retest studies were determined with the ICC coefficient (0.878), and it was shown that the ICC coefficient varied between 0.713 and 0.995. In addition, the Cronbach alpha value was found to be between 0.90 and 0.85, which shows that the scale has a high internal consistency. Both scales consist of 10 questions. It is measured with a 1–5-point scale out of 9 questions that evaluate the level of physical activity; low scores indicate low activity, and high scores indicate high activity. The first and ninth questions are evaluated by dividing them between 14 and 7, respectively, while the other questions cover activities performed at certain times of the day. The average of the scores of all questions determines the child's total physical activity level; "1" means low, and "5" means high physical activity (Aygün-Polat, 2017; Erdim et al., 2019).

Digital Addiction Scale: The reliability of the Digital Addiction Scale, whose validity and reliability were conducted by Kaçmaz et al. (2023), was evaluated with the Cronbach Alpha coefficient and was recorded as 0.84 for interpersonal relationships, 0.85 for introverted factors, and 0.90 for the general scale. This scale consists of 25 items and 2 sub-dimensions. These sub-dimensions are interpersonal relationships (items 4, 6, 9, 10, 13, 16, 17, 18, 19, 20, 22, 23, and 25), introverted factors (items 1, 2, 3, 5, 7, 8, 11, 12, 14, 15, 21 and 24). There are no reverse-scored items. The total score that can be obtained from the scale varies between 25 and 125, with higher scores indicating a greater risk of digital addiction.

Handgrip Strength Test: Handgrip strength is necessary for many functional activities in daily life (Lee & Gong, 2020). It is recommended that handgrip strength be included in comprehensive health assessments for children and adolescents in school and clinical settings (Matsudo et al., 2014). This test is a method frequently used in epidemiological studies of muscle strength, endurance, and flexibility (Ortega et al., 2008). Measuring muscle strength with a hand-held dynamometer is an effective, low-cost, and practical method for clinically assessing the health status of individuals (Amaral et al., 2015) and is one of the most used tests to assess muscle fitness in epidemiological studies.

The optimum grip aperture is affected by hand size in both genders, which indicates that the grip aperture of the dynamometer should be adjusted according to the individual's hand size. A Takai brand (Tokyo, Japan) Hand Dynamometer was used to measure hand grip strength. This dynamometer has been shown to have the highest standards of validity and reliability in measuring maximum hand grip strength for the young group (España-Romero et al., 2010).

To determine the dominant hand, participants were asked which hand they used while writing. Before measuring grip strength, the dynamometer was adjusted according to the participant's hand size. Handspan was determined by measuring the farthest distance between the thumb and the tip of the little finger on the dominant hand (Noonari et al., 2019). The measurement was performed in a sitting position, with the humerus positioned at the side of the body and the elbow flexed at 90 degrees. In each trial, participants were instructed to squeeze the dynamometer with maximum effort for two to three seconds (Steffl et al., 2017). Grip strength measurements for the dominant hands of the participants were taken at least twice, and the highest value was recorded in kilograms (Sartorio et al., 2002).

Ethical Approval

Permission was obtained from the İzmir Governorship Provincial Directorate of National Education for the conduct of the study. The research was deemed appropriate by the Ege University Medical Faculty Medical Research Ethics Committee (28/12/2023; Number: 21-1.1T/58) to follow the 'Ethical Principles in Medical Research Conducted on Human Subjects. Each athlete was informed about the study order and possible risks, and written-signed consents of the athletes and their parents were obtained through the "Informed Consent Form."

Analysis of Data

Statistical analyses of the data were evaluated using the SPSS (version 25.0, SPSS Inc, Chicago, IL, USA) statistical program. Descriptive data of the total, gender, and age-based digital addiction scale, physical activity scale, and hand grip strength test results of all participants were expressed as mean, standard deviation, and minimum and maximum values. The compliance of the data with normal distribution was determined with the Kolmogorov-Smirnov test. According to this result, the difference between the scale and test results between genders was analyzed with the Mann-Whitney U test or the Independent Sample t-test. Kruskal Wallis-H and Mann-Whitney U test, or one-way analysis of variance, and Dunn Bonferroni (post hoc) tests were used to determine the difference between the scale and test results according to age. The effect size of the differences was reported according to partial eta squared (ηp^2) values. The level of relationship between the data was analyzed using Spearman's rank correlation coefficient test. The value of $p \leq 0.05$ was taken as the basis for significance.

The sample size was calculated with G-power (version 3.1.9.7, Franz Faul, Universitat Kiel, Dusseldorf, Germany). In the power analysis, a sample size of at least 366 was determined to determine a small effect size ($p = 0.17$) with $\alpha = 0.05$ and a 1-β margin of error of 0.95 for relational measures.

RESULTS

Table 1 shows the age, PA level, DA level scale scores, and hand grip strength results of 400 students between the ages of 8 and 17 who voluntarily participated in the study.

Table 1. Descriptive data of the participants

Variables	Min.	Max.	Mean	Std. Dev.
Age (year)	8.0	17.0	11.9	2.53
Physical activity level (score)	1.44	4.89	3.44	0.58
Digital addiction level (score)	25.0	110	55.7	15.8
Handgrip test result (kg)	6.50	63.3	23.9	9.82

The frequency distribution of the participants according to their age and gender is given in Table 2. Accordingly, it was understood that the highest number of participants were aged 10 (n=63, 15.8%) and 11 (n=62, 15.5%); there were more females (n=267, 66.8%) than males (n=133, 33.3%).

Table 2. Frequency distribution of participants according to age and gender

Age	Frequency (n)	Rate (%)
8.00	43	10.8
9.00	27	6.75
10.0	63	15.8
11.0	62	15.5
12.0	56	14.0
13.0	40	0.10
14.0	27	6.75
15.0	35	8.75
16.0	37	9.25
17.0	10	2.50
Total	400	100
Gender	**Frequency (n)**	**Rate (%)**
Female	267	66.8
Male	133	33.3
Total	400	100

The data in the research were analyzed for compliance with normal distribution using the Kolmogorov-Smirnov test. Accordingly, physical activity level scores ($p=0.003$) and hand grip strength results ($p<0.000$) are not normally distributed, whereas digital addiction level scores ($p=0.200$) show a normal distribution.

Table 3 shows the distribution of participants' PA and DA levels and hand grip strengths by gender. Accordingly, men's results are higher than women's in all measurement parameters.

Table 3. Distribution of participants' physical activity, digital addiction levels, and hand grip strengths between genders

Female (n=267)	**Min.**	**Max.**	**Mean**	**Std. Dev.**
Physical activity level (score)	1.44	4.78	3.40	0.56
Digital addiction level (score)	7.80	46.5	23.2	7.58
Handgrip test result (kg)	25.0	107	55.0	15.0
Male (n=133)				
Physical activity level (score)	1.89	4.89	3.52	0.62
Digital addiction level (score)	6.50	63.3	25.3	13.2
Handgrip test result (kg)	25.0	110	57.1	17.2

Physical activity level and handgrip strength results were compared between genders, and PA level scores were significantly different between genders (p =0.020) (Table 4).

Table 4. Comparison of physical activity level and handgrip strength results between genders (Mann-Whitney U test)

	Physical activity level (score)	**Handgrip test result (kg)**
Mann-Whitney U	15225.5	17062.5
Wilcoxon W	51003.5	25973.5
Z	-2.327	-.636
p-value	**.020**	.525

Digital addiction level scores were compared between genders, and no significant difference was found (p =0.200) (Table 5).

Table 5. Comparison of digital addiction level scores between genders (Independent Sample T Test)

DA level score	t	df	p-value	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Equal variances assumed	-1.283	398	.200	-2.1464	1.673	-5.44	1.142

When the participants' physical activity scores were evaluated according to age, it was determined that the highest physical activity score was in the 17 to 8 age group (Table 6).

Table 6. Distribution of participants' physical activity scores according to age

Age	N	Mean	Std. Dev.	Min.	Max.
8.00	43	**3.52**	0.68	1.89	4.89
9.00	27	3.29	0.56	1.44	4.56
10.0	63	3.44	0.59	2.22	4.56
11.0	62	3.48	0.49	2.44	4.44
12.0	56	3.39	0.63	1.89	4.67
13.0	40	3.40	0.57	2.22	4.78
14.0	27	3.44	0.59	2.00	4.33
15.0	35	3.42	0.55	2.00	4.33
16.0	37	3.37	0.60	2.00	4.44
17.0	10	**3.91**	0.49	3.11	4.78

When the participants' handgrip strengths were evaluated according to age, the highest handgrip strength was found in the 17—and 16-year-old age groups (Table 7).

Table 7. Distribution of participants' hand grip strengths according to age

Age	N	Mean	Std. Dev.	Min.	Max.
8.00	43	12.62	3.00	6.50	23.2
9.00	27	16.54	2.98	11.3	22.1
10.0	63	17.94	3.38	11.8	25.3
11.0	62	21.19	4.94	10.9	40.0
12.0	56	22.09	4.30	13.3	31.9
13.0	40	27.58	6.09	14.4	46.5
14.0	27	33.16	8.82	15.5	49.2
15.0	35	31.28	8.22	13.9	52.9
16.0	37	37.08	9.07	23.0	59.4
17.0	10	44.75	13.0	29.7	63.3

Participants' physical activity level and handgrip strength results were compared between ages, and it was found that handgrip strength was significantly different between ages ($p < 0.001$) (Table 8).

Table 8. Comparison of participants' physical activity level and handgrip strength results between ages (Kruskal Wallis Test)

	Physical activity level (score)	Handgrip test result (kg)
Kruskal-Wallis H	10.317	274.943
df	9	9
p-value	.325	**<0.001**

The Mann-Whitney U test was applied to determine which ages caused the significant difference in hand grip strength, and a significant difference was found between all ages except for the

comparisons between the ages of 9-10, 11-12, 14-15, 14-16 and 16-17 ($p<0.05$). The distribution of participants' digital addiction level scores between ages is shown in Table 9.

Table 9. The distribution of the participants' digital addiction level scores between ages

	N	Mean	Std. Dev.	Min.	Max.
8.00	43	46.56	15.7	25.0	89.0
9.00	27	50.96	14.5	31.0	101
10.0	63	53.03	15.0	25.0	96.0
11.0	62	57.81	16.5	26.0	107
12.0	56	55.55	13.5	29.0	89.0
13.0	40	58.68	15.9	28.0	95.0
14.0	27	58.93	12.4	25.0	77.0
15.0	35	**60.77**	13.2	35.0	91.0
16.0	37	58.08	19.1	27.0	110
17.0	10	**63.80**	16.7	48.0	98.0

One-way Variance Analysis was used to compare the digital addiction levels of the participants according to their ages, and a significant difference was found ($p= 0.001$) (Table 10).

Table 10. Comparison of the digital addiction levels of the participants according to their ages

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7138.57	9	793.174	3.357	**0.001**
Within Groups	92134.54	390	236.242		
Total	99273.11	399			

The Bonferroni post hoc test was applied to determine which ages caused the significant difference in digital addiction levels. A significant difference was found between the ages of 8 and 11 ($p= 0.015$), 13 ($p= 0.017$), 15 ($p= 0.003$), and 16 ($p= 0.041$).

The level of relationship between the measured data of the participants was analyzed with Spearman's Rank Coefficient Test, and a positive correlation was found between age and digital addiction level ($r= 0.252$, $p <0.001$) and hand grip strength ($r= 0.822$, $p <0.001$).

DISCUSSION

In this study, which aimed to investigate the relationship between digital addiction and physical activity levels in children and adolescents, the hypothesis that as children age, DA levels and hand grip strength increase while PA level decreases was confirmed. Additionally, the hypothesis that PA level and hand grip strength would differ between genders in children and adolescents was also confirmed, as was the hypothesis that DA level would not differ between genders. However, the hypothesis that children and adolescents with high DA levels would have low PA levels and hand grip strength could not be confirmed.

Some cross-sectional studies have predicted that higher PA levels may reduce the rates of DA among adolescents and young adults, suggesting a negative correlation between PA and DA (Kim et al., 2015; Li et al., 2021; Zhong et al., 2020; Yang et al., 2019). In contrast, physical inactivity has been shown to increase the risk of DA due to long-term use of mobile phones, and there is evidence that sedentary behaviors and low PA levels are strong predictors of time spent using smartphones in adolescents and adults (Barkley & Lepp, 2016; Fennell et al., 2019; Haug et al., 2015; Xiang et al., 2020). In addition, the findings obtained in the studies generally show that as age increases, DA levels and hand grip strength increase, whereas PA levels decrease, and PA levels and hand grip strength are higher in boys than in girls. Unlike our findings, it was found that the DA level was higher in boys than in girls and that children and adolescents with higher DA levels had lower PA levels and hand grip strength. For example, a high level of negative correlation was found between the total scores of digital game addiction and PA levels of a total of 330 participants ($r = -0.35$, $p < 0.01$). It was observed that the total mean score of male students for digital game addiction was higher than that of female students, and this difference was statistically significant. Students with higher PA levels had significantly lower levels of digital game addiction (Hazar et al., 2017).

In one study, it was found that obese children and adolescents had higher internet addiction scores than non-obese ones. The average internet addiction scores of boys were found to be higher than those of girls. No difference was found in internet addiction scores in the three subgroups examined: 8-12 years old, 12-15 years old, and 15-18 years old (Koca et al., 2023). In middle school students aged 11-14, it was found that male students were exposed to digital screens for longer periods than female students in terms of PA levels. As a result of the study, the average daily screen use of students was found to be two hours. In studies conducted in this context in the literature, it was found that students were exposed to screens for longer periods (Güneş et al., 2023).

In a study on the effects of smartphone addiction on physical activity in secondary school children, PA levels were found to be significantly lower in female participants aged 12-14 with high internet and phone use. In male participants with normal internet and phone use, it was found that they showed significantly higher results in physical performance measurements, including left and right-hand grip strength and vertical jump height. As a result of this study, it was determined that children without smartphone addiction had significantly more PA compared to those who were addicted (Al-Amri et al., 2023).

In a study investigating the psychological state of problematic internet use in adolescents, their compliance with the Mediterranean diet, and the physical activity level of a total of 791 students between the ages of 12 and 16, it was reported that problematic mobile phone and internet use negatively affected this age group physically and psychologically. It was shown that problematic internet use was more intense with low PA, especially in girls, while problematic internet and mobile phone use did not negatively affect hand grip strength and vertical jump results in boys (Mateo-Orcajada et al., 2023). In a study conducted with parents of children aged 6-12 years and

investigating the effect of children's technology use on PA levels, it was found that excessive use of technological devices was significantly associated with low PA levels. It was also suggested that children who used devices for less than five hours a week tended to reach higher PA levels than those who used devices for more than six hours a week (Alotaibi et al., 2020).

The relationship between exercise, PA, and internet use was investigated in students aged 13-15, and it was revealed that students who continued to exercise spent less time using the internet. This finding was supported by the fact that PA could be a helpful factor in reducing online time in students in this age group (Lapousis, 2016). In a study addressing the harms of media and technology using the categories of children (4-8 years old), pre-adolescents (9-12 years old), and adolescents (13-18 years old), it was stated that children, pre-adolescents, and adolescents who had more screen time tended to participate in lower PA. When pre-adolescents and adolescents were examined, increased daily media and technology use had a negative impact on physical health status and was associated with a weakening tendency to engage in PA (Rosen et al., 2014).

In a study examining sedentary behaviors, it was observed that boys aged 3-11 used electronic games and computers more than girls of the same age, but total screen time use was similar in boys and girls. It was stated that PA decreased as the time spent in front of the screen increased. Especially in adolescents (12-18 years), more screen time use was associated with decreased PA time (Biddle et al., 2010). At the same time, studies in Turkey revealed that internet use was more common among boys (Sasmaz et al., 2014). In the study examining the relationship between internet addiction, mental health, and PA among 459 female students with an average age of 12, it was found that internet addiction had a significant inverse relationship with PA. In general, the PA level of the participating girls in this study was found to be low. In addition, it was found that girls who spent more time online had lower PA levels (Baniasadi et al., 2022).

In our study, the fact that the PA levels and hand grip strengths of children and adolescents with high DA levels were not lower and that the DA levels did not differ between genders, may be attributed to the sample group consisting of students from private schools with substantial financial resources and children and adolescents who attended sports clubs. Although not explored in this study, the combination of a balanced diet, regular physical activity, and a lifestyle that moderates digital device usage —encouraged by educated and mindful parents— may help clarify the results obtained. The intentional choices of such parents to enhance the overall health and fitness of their children could be linked to the positive outcomes observed in the study. The only study that yielded results similar to this research but differed from others was the one that found that adolescents' risky behaviors related to internet use did not significantly affect physical activity levels. (Chacón-Borrego et al., 2018).

In addition, studies have shown that excessive internet and computer use is associated with a higher body mass index, even in individuals with high PA levels. This finding suggests that reducing the time spent on sedentary behaviors such as computer and internet use in leisure time, as well as nutrition and PA strategies, may be important for reducing excess weight and obesity rates

(Vandelanotte et al., 2009). Children who adopt a sedentary lifestyle (internet use, watching television, playing computer games) may have an unhealthy life and chronic diseases compared to children who adopt an active lifestyle both during childhood and adolescence (Hills et al., 2007). Excessive use of digital devices such as smartphones and portable games by children and adolescents may negatively affect fine motor skills, manual dexterity, grip strength, and other manual skills. At the same time, digital addiction can lead to thumb and forearm pain and visual impairments (El-Sharkawy et al., 2024). Since significant developmental differences occur during adolescence, which is the most vulnerable age group for internet addiction, internet use may appeal to individuals during this period, and this may cause them to experience social and physical problems. The development of risky behaviors (substance and tobacco use), poor sleep habits, and physical inactivity have been observed in adolescents who use the internet excessively (Durkee et al., 2016). Adolescents who spend too much time watching television, using computers, and playing video games may be associated with being overweight, having decreased PA, and energy expenditure (Melchior et al., 2014). PA levels can be increased through an automatic and internet-based behavioral change system. These aspects of internet use should be explored and implemented in terms of physical health benefits (Hurling et al., 2007).

Some limitations should be noted in the evaluation of this study. First, the study results can only be attributed to the young population between the ages of 8 and 17. Second, the composition of the study group, which included private school students and active participants in various sports clubs, may have influenced the findings regarding the unmet hypothesis of a negative correlation between physical activity levels and digital addiction.

CONCLUSIONS

When the participants' DA and PA levels and handgrip strengths were compared according to gender, it was found that the results for men were higher than those for women. The difference in PA level scores between genders was significant. When evaluated according to age, it was found that the highest PA score of the participants was in the 8 to 17 age group, the highest hand grip strength was in the 16 to 17 age group, and the highest DA score was in the 15 to 17 age group. The participants' DA level, PA level, and handgrip strength results were compared between ages, and it was found that handgrip strength ($p<0.001$) and DA levels ($p=0.001$) were significantly different between ages. A significant difference was found in hand grip strength between all ages except for the ages of 9-10, 11-12, 14-15, 14-16, and 16-17. A significant difference was found in DA levels between the ages of 8 and 11, 13, 15, and 16. A positive significant correlation was found between age, DA level, and handgrip strength.

In future studies on this subject, data collection tools that address the differences between male and female participants regarding biological, psychological, and socio-cultural factors can be utilized when examining gender differences. More research should be conducted to understand the reasons for the observed differences, particularly among certain age groups. Additionally, future

studies could explore the impact of families on digital device usage and how they influence children's daily habits, which would significantly contribute to the field. Based on the study's results, educational programs and interventions aimed at balancing technology use may be designed, along with awareness-raising strategies at both individual and societal levels.

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REFERENCES

Al-Amri, A., Abdulaziz, S., Bashir, S., Ahsan, M., & Abualait, T. (2023). Effects of smartphone addiction on cognitive function and physical activity in middle-school children: A cross-sectional study. *Frontiers in psychology, 14*, Article 1182749. https://doi.org/10.3389/fpsyg.2023.1182749

Alotaibi, T., Almuhanna, R., Alhassan, J., Alqadhib, E., Mortada, E., & Alwhaibi, R. (2020). The relationship between technology use and physical activity among typically developing children. *Healthcare (Basel, Switzerland), 8*(4), Article 488. https://doi.org/10.3390/healthcare8040488

Amaral, C. de A., Portela, M. C., Muniz, P. T., Farias, E. dos S., Araújo, T. S., & Souza, O. F. (2015). Association of handgrip strength with self-reported diseases in adults in Rio Branco, Acre State, Brazil: A population-based study. *Cadernos de Saúde Pública, 31*(6), 1313–1325. https://doi.org/10.1590/0102-311X00062214

Aygün-Polat, E. (2017). *Adölesanlarda Fiziksel Aktivite Anketinin Türkçe versiyon, geçerlik ve güvenirlik çalışması* [Yayımlanmamış yüksek lisans tezi]. Gazi Üniversitesi.

Azam, M., Ali, A., Mattiullah, J., & Perveen, N. (2020). Physical activity, sports participation, and smartphone addiction in adolescent students: A systematic review. *Journal of Evidence-Based Psychotherapies, 20*(1), 25-42.

Aziz, N., Nordin, M. J., Abdulkadir, S. J., & Salih, M. (2021). Digital addiction: Systematic review of computer game addiction impact on adolescent physical health. *Electronics, 10*(9), Article 996. https://doi.org/10.3390/electronics10080996

Baltacı, G. (2012). *Obesity and exercise*. Sağlık Bakanlığı Yayın No: 730.

Baniasadi, T., Ranjbari, S., Abedini, A., Dana, A., & Ghorbani, S. (2022). Investigation of the association of internet addiction with mental health and physical activity in teenage girls: The mediating role of parental attitude. *Women Health Bulletin, 9*(4), 243-250. https://doi.org/10.30476/WHB.2022.96915.1197

Barkley, J.E., & Lepp, A. (2016). Mobile phone use among college students is a sedentary leisure behavior which may interfere with exercise. *Computers in Human Behavior, 56*, 29-33.

Biddle, S. J., Pearson, N., Ross, G. M., & Braithwaite, R. (2010). Tracking of sedentary behaviours of young people: A systematic review. *Preventive medicine*, *51*(5), 345–351. https://doi.org/10.1016/j.ypmed.2010.07.018

Bozkurt, H., Özer, S., Şahin, S., & Sönmezgöz, E. (2018). Internet use patterns and Internet addiction in children and adolescents with obesity. *Pediatric obesity, 13*(5), 301–306. https://doi.org/10.1111/ijpo.12216

Chacón-Borrego, F., Castañeda-Vázquez, C., Del Pozo-Cruz, J., & Corral-Pernía, J. (2018). Social use of internet in adolescents: Relationship with cyberbullying and levels of physical activity. *Journal of Human Sport and Exercise, 13*(2proc), S209-S220. https://doi.org/10.14198/jhse.2018.13.Proc2.05

Cohen, J., Pitetti, K. H., & Haegele, J. A. (2016). Physical fitness and health in children with disabilities: A systematic review. *Journal of Disability Policy Studies*, *27*(2), 69–80. https://doi.org/10.1177/1044207316670121

Deursen, A. J., Bolle, C. L., Hegner, S. M., & Kommers, P. (2015). Modeling habitual and addictive smartphone behavior: The role of smartphone usage types, emotional intelligence, social stress, self-regulation, age, and gender. *Computers in Human Behavior, 45*, 411-420. https://doi.org/10.1016/j.chb.2014.12.045

Dresp-Langley, B. (2020). Children's health in the digital age. *International Journal of Environmental Research and Public Health, 17*(9), Article 3240. https://doi.org/10.3390/ijerph17093240

Durkee, T., Carli, V., Floderus, B., Wasserman, C., Sarchiapone, M., Apter, A., Balazs, J. A., Bobes, J., Brunner, R., Corcoran, P., Cosman, D., Haring, C., Hoven, C. W., Kaess, M., Kahn, J. P., Nemes, B., Postuvan, V., Saiz, P. A., Värnik, P., & Wasserman, D. (2016). Pathological internet use and risk-behaviors among European adolescents. *International Journal of Environmental Research and Public Health, 13*(3), 294. https://doi.org/10.3390/ijerph13030294

Eisenmann, J. C., & Wickel, E. E. (2009). The biological basis of physical activity in children: Revisited. *Pediatric Exercise Science, 21*(3), 257–272. https://doi.org/10.1123/pes.21.3.257

Eliacik, K., Bolat, N., Koçyiğit, C., Kanik, A., Selkie, E., Yilmaz, H., Catli, G., Dundar, N. O., & Dundar, B. N. (2016). Internet addiction, sleep and health-related life quality among obese individuals: A comparison study of the growing problems in adolescent health. *Eating and Weight Disorders: EWD, 21*(4), 709–717. https://doi.org/10.1007/s40519-016-0327-z

El-Sharkawy, M. A. E., Hanna, S., & Mohamed, N. E. (2024). Touch-screen technology and pediatric population: Hand skills, pain, and quality of life: A narrative review. *The Egyptian Journal of Hospital Medicine, 96*, 2720-2726. https://doi.org/10.12816/ejhm.2024.12345

Erdim, L., Ergün, A., & Kuğuoğlu, S. (2019). Reliability and validity of the Turkish version of the Physical Activity Questionnaire for Older Children (PAQ-C). *Turkish Journal of Medical Sciences, 49*, 162-169. https://doi.org/10.3906/sag-1806-212

España-Romero, V., Ortega, F. B., Vicente-Rodríguez, G., Artero, E. G., Rey, J. P., & Ruiz, J. R. (2010). Elbow position affects handgrip strength in adolescents: Validity and reliability of Jamar, DynEx, and TKK dynamometers. *Journal of Strength and Conditioning Research, 24*(1), 272-277. https://doi.org/10.1519/JSC.0b013e3181b296a5

Fennell, C., Barkley, J.E., & Lepp, A. (2019). The relationship between cell phone use, physical activity, and sedentary behavior in adults aged 18–80. *Computers in Human Behavior, 90*, 53–59. https://doi.org/10.1016/j.chb.2018.08.044

Graves, L., Murphy, R., & Macfarlane, D. (2010). The effects of physical activity on the development of handgrip strength in children. *Journal of Strength and Conditioning Research*, *24*(8), 2221–2227. https://doi.org/10.1519/JSC.0b013e3181e90f1f

Gülbetekin, E., Güven, E., & Tuncel, O. (2021). Adolesanların dijital oyun bağımlılığı ile fiziksel aktivite tutum ve davranışlarını etkileyen faktörler. *Bağımlılık Dergisi, 22*(2), 148-160. https://doi.org/10.51982/bagimli.866578

Güneş, B., Alkan, I., Bora Güneş, N., Keskin, M. T., & Dağ, O. (2023). Relationship between physical activity levels of the secondary school students and their safe environment, playing conditions and media usage. *Hacettepe University Journal of Education, 38*(1), 27-38. https://doi.org/ 10.16986/HUJE.2023.478

Guthold, R., Cowan, M. J., Autenrieth, C. S., Kann, L., & Riley, L. M. (2010). Physical activity and sedentary behavior among schoolchildren: A 34-country comparison. *The Journal of Pediatrics, 157*(1), 43–49.e1. https://doi.org/10.1016/j.jpeds.2010.01.019

Haug, S., Castro, R. P., Kwon, M., Filler, A., Kowatsch, T., & Schaub, M. P. (2015). Smartphone use and smartphone addiction among young people in Switzerland. *Journal of Behavioral Addictions, 4*(4), 299–307. https://doi.org/10.1556/2006.4.2015.037

Hazar, Z., Demir, G. T., Namlı, S., & Türkeli, A. (2017). Investigation of the relationship between digital game addiction and physical activity levels of secondary school students. *Niğde Üniversitesi Beden Eğitimi ve Spor Bilimleri Dergisi*, *11*(3), 320-332.

Hills, A. P., King, N. A., & Armstrong, T. P. (2007). The contribution of physical activity and sedentary behaviours to the growth and development of children and adolescents: Implications for overweight and obesity. *Sports Medicine (Auckland, N.Z.), 37*(6), 533–545. https://doi.org/10.2165/00007256-200737060-00006.

Hurling, R., Catt, M., Boni, M. D., Fairley, B. W., Hurst, T., Murray, P., Richardson, A., & Sodhi, J. S. (2007). Using internet and mobile phone technology to deliver an automated physical activity program: Randomized controlled trial. *Journal of Medical Internet Research, 9*(2), Article e7. https://doi.org/10.2196/jmir.9.2.e7

Kaçmaz, C., Cumurcu, B., & Çelik O. T. (2023). Çocuklar için dijital bağımlılık ölçeğinin Türkçeye uyarlanması: Güvenirlik ve geçerlilik analizi. *Bağımlılık Dergisi, 24*(4), 495-506. https://doi.org/10.51982/bagimli.1261063

Kim, S. E., Kim, J. W., & Jee, Y. S. (2015). Relationship between smartphone addiction and physical activity in Chinese international students in Korea. *Journal of Behavioral Addictions, 4*(3), 200–205. https://doi.org/10.1556/2006.4.2015.028

Koca, S. B., Paketçi, A., & Büyükyılmaz, G. (2023). The relationship between internet usage style and internet addiction and food addiction in obese children compared to healthy children. *Turkish Archives of Pediatrics, 58*(2), 205–211. https://doi.org/10.5152/TurkArchPediatr.2023.22183

Kuss, D. J., Griffiths, M. D., Karila, L., & Billieux, J. (2014). Internet addiction: A systematic review of epidemiological research for the last decade. *Current Pharmaceutical Design, 20*(25), 4026–4052. https://doi.org/10.2174/ 1381612811 3199990617

Lapousis, X. G. (2016). The relation between physical activity and the use of internet in schoolchildren aged 13-15 years old. *The Swedish Journal of Scientific Research*, *3*(11), 1-6.

Lee, S. H., & Gong, H. S. (2020). Measurement and interpretation of handgrip strength for research on sarcopenia and osteoporosis. *Journal of Bone Metabolism, 27*(2), 85–96. https://doi.org/10.11005/jbm.2020.27.2.85s

Li, Y., Sun, Q., Sun, M., Sun, P., Sun, Q., & Xia, X. (2021). Physical exercise and psychological distress: The mediating roles of problematic mobile phone use and learning burnout among adolescents. *International Journal of Environmental Research and Public Health, 18*(17), Article 9261. https://doi.org/10.3390/ijerph18179261

Mateo-Orcajada, A., Vaquero-Cristóbal, R., Albaladejo-Saura, M. D., & Abenza-Cano, L. (2023). The Degree of problematic technology use negatively affects physical activity level, adherence to Mediterranean diet and psychological state of adolescents. *Healthcare (Basel, Switzerland), 11*(12), Article 1706. https://doi.org/10.3390/healthcare11121706

Matsudo, V.K., Matsudo, S.M., Rezende, L.D., & Raso, V. (2014). Handgrip strength as a predictor of physical fitness in children and adolescents. *Brazilian Journal of Kinanthropometry and Human Performance, 17*, 1-10. https://doi.org/10.500 7/1980-0037.2015v17n1p1

Melchior, M., Chollet, A., Fombonne, E., Surkan, P. J., & Dray-Spira, R. (2014). Internet and video game use in relation to overweight in young adults. *American Journal of Health Promotion: AJHP, 28*(5), 321–324. https://doi.org/10.4278/ ajhp.121023-ARB-515

Meşe-Yavuz, C., & Başyiğit, N. (2023). Genç yetişkinlerde vücut kompozisyonu, fiziksel aktivite ve el kavrama kuvveti ilişkisi. *SPORMETRE Beden Eğitimi ve Spor Bilimleri Dergisi*, *21*(1), 47-56. https://doi.org/10.33689/spormetre.1132002.

Meydanlıoğlu, A. (2015). Çocuklarda fiziksel aktivitenin biyopsikososyal yararları. *Çocuk ve Adolesan Psikiyatri Dergisi*, *7*(2), 125-135. https://doi.org/10.5455/cap.20140714124129

Noonari, S., Samejo, B., & Nonari, M. (2019). The association between hand grip strength and hand span of dominant and non-dominant hand of undergraduate physiotherapy students. *Journal of Modern Rehabilitation, 13*(4), 193–198. https://doi.org/0.32598/JMR.13.4.193

Ortega, F. B., Ruiz, J. R., Castillo, M. J., & Sjöström, M. (2008). Physical fitness in childhood and adolescence: a powerful marker of health. *International Journal of Obesity, 32*(1), 1–11. https://doi.org/10.1038/sj.ijo.0803774

Park, C.S., & Park, Y.R. (2014). The conceptual model on smart phone addiction among early childhood. *International Journal of Social Science and Humanity, 4*, 147-150. https://doi.org/10.7763/IJSSH.2014.V4.336

Pop, C.L. (2015). The digital generation's physical activities. *The Anthropologist, 19*(3), 737-740. https://doi.org/10.1080/09720073.2015.11891709

Poskotinova, L. V., Krivonogova, O. V., & Zaborsky, O. S. (2021). Cardiovascular response to physical exercise and the risk of internet addiction in 15-16-year-old adolescents. *Journal of Behavioral Addictions, 10*(2), 347–351. https://doi.org/10.1556/2006.2021.00021

Rosen, L. D., Lim, A. F., Felt, J., Carrier, L. M., Cheever, N. A., Lara-Ruiz, J. M., Mendoza, J. S., & Rokkum, J. (2014). Media and technology use predicts ill-being among children, preteens and teenagers independent of the negative health impacts of exercise and eating habits. *Computers in Human Behavior*, *35*, 364–375. https://doi.org/10.1016/j.chb.2014.01.036

Sartorio, A., Lafortuna, C. L., Pogliaghi, S., & Trecate, L. (2002). The impact of gender, body dimension and body composition on hand-grip strength in healthy children. *Journal of Endocrinological Investigation*, *25*(5), 431–435. https://doi.org/10.1007/BF03344033

Sasmaz, T., Oner, S., Kurt, A. Ö., Yapici, G., Yazici, A. E., Bugdayci, R., & Sis, M. (2014). Prevalence and risk factors of internet addiction in high school students. *European Journal of Public Health, 24*(1), 15–20. https://doi.org/10. 1093/eurpub/ckt051

Steffl, M., Chrudimsky, J., & Tufano, J. J. (2017). Using relative handgrip strength to identify children at risk of sarcopenic obesity. *PLoS ONE 12*(5), Article e0177006. https://doi.org/10.1371/journal. pone.0177006

Vandelanotte, C., Sugiyama, T., Gardiner, P., & Owen, N. (2009). Associations of leisure-time Internet and computer use with overweight and obesity, physical activity, and sedentary behaviors: Cross-sectional study. *Journal of Medical Internet Research, 11*(3), Article e28. https://doi.org/10.2196/jmir.1218

Xiang, M. Q., Lin, L., Wang, Z. R., Li, J., Xu, Z., & Hu, M. (2020). Sedentary behavior and problematic smartphone use in Chinese adolescents: The moderating role of self-control. *Frontiers in Psychology, 10*, Article 3032. https://doi.org/10.3389/fpsyg. 2019.03032

Yang, G., Tan, G. X., Li, Y. X., Liu, H. Y., & Wang, S. T. (2019). Physical exercise decreases the mobile phone dependence of university students in China: The mediating role of self-control. *International Journal of Environmental Research and Public Health*, *16*(21), Article 4098. https://doi.org/10.3390/ijerph16214098

Yılmaz, B., & Özkan, Y. (2024). Çocuk ve gençlerde teknoloji bağımlılığı üzerine yazılan lisansüstü tezlerin içerik analizi. *İGÜ Sosyal Bilimler Dergisi*, *23*, 656-678. https://doi.org/10.38079/igusabder.1363493

Zhong, W., Wang, Y., & Zhang, G. (2020). The impact of physical activity on college students' mobile phone dependence: The mediating role of self-control. *International Journal of Mental Health Addiction*, *19*(6), 2144–2159. https://doi.org/10.1007/s11469-020-00308-x

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Investigating the Effect of Physical Activity Levels of Municipality Employees on their Healthy Lifestyle Behaviors During the COVID-19 Pandemic*

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Abstract

This study aimed to determine the effect of Physical Activity (PA) levels of municipal employees between the ages of 18-65 on Healthy Lifestyle Behaviors (HLB) according to their age, education level, and marital status during the COVID-19 pandemic period. A total of 368 volunteer personnel between the ages of 18 and 65 working in various directorates and positions of Bornova Municipality, such as Press and Broadcasting, Culture and Social Affairs, Police, Social Aid Affairs, Veterinary, Parks and Gardens, Financial Services, Zoning, Legal Affairs, Security and Support Services, were included in the study After a detailed explanation about the study was given to the participants, the Personal Information Form, the International Physical Activity Questionnaire (IPAQ) Short Form, and the HLB Scale II were applied. As a result of the analysis, statistically significant low-level negative relationships were found between the participants' PA scores and their ages ($p<.05$). It was found that the participants' PA scores showed statistically significant differences according to their marital status, occupational group and childbearing status ($p<.05$); and that they did not show statistically significant differences according to their body mass index, smoking/alcohol use status, social security status, education status and type of residence ($p>.05$). In addition, a low-level statistically significant negative relationship was found between their HLB scores and age ($p<.05$). It was found that the PA, nutrition, stress management sub-dimensions and HLB total scores showed statistically significant differences according to marital status ($p<.05$); and the HLB sub-dimensions and total scores showed statistically significant differences according to childbearing status ($p<.05$). As a result, it was observed that as the PA levels of municipal employees increased during the COVID-19 period, both the HLB sub-dimensions and the HLB total scores would increase. This situation shows the effect of FA levels on HLB.

Keywords: Municipal employees, Physical activity, Healthy lifestyle style

COVİD-19 Pandemi Döneminde Belediye Çalışanlarının Fiziksel Aktivite Düzeylerinin Sağlıklı Yaşam Biçimi Davranışlarına Etkisinin İncelenmesi

Öz

Bu çalışmanın amacı, COVID-19 pandemi döneminde 18-65 yaşları arasındaki belediye çalışanlarının fiziksel aktivite (FA) düzeylerinin yaş, eğitim düzeyi, medeni durumlarına göre sağlıklı yaşam biçimi davranışlarına (SYBD) etkisini belirlemektir. Çalışmaya, Bornova Belediyesinin Basın Yayın, Kültür Sosyal İşler, Zabıta, Sosyal Yardım İşleri, Veterinerlik, Park Bahçeler, Mali Hizmetler, İmar, Hukuk İşleri, Güvenlik ve Destek Hizmetleri gibi çeşitli müdürlüklerinde ve pozisyonlarda 18 – 65 yaşları arasında toplam 368 gönüllü personel dahil edilmiştir. Katılımcılara çalışma ile ilgili detaylı açıklama yapıldıktan sonra Kişisel Bilgi Formu, Uluslararası Fiziksel Aktivite Anketi Kısa Formu, Sağlıklı Yaşam Biçimi Davranışları Ölçeği II uygulanmıştır. Analiz neticesinde katılımcıların, FA puanları ile yaşları arasında istatistiksel anlamda negatif yönde düşük düzeyde anlamlı ilişkiler saptanmıştır ($p<.05$). Katılımcıların FA puanlarının, medeni duruma, meslek gruplarına ve çocuk sahibi olma durumlarına göre istatistiksel olarak anlamlı farklılık gösterdiği ($p<.05$); Beden Kütle İndeksi (BKI) durumlarına, sigara/alkol kullanma durumlarına, sosyal güvence durumlarına, eğitim durumlarına ve yaşanılan konut tipine göre istatistiksel olarak anlamlı farklılık göstermediği tespit edilmiştir ($p>.05$). Ayrıca SYBD puanları ile yaşları arasında negatif yönde düşük düzeyde istatistiksel olarak anlamlı ilişki saptanmıştır ($p<.05$). FA, beslenme, stres yönetimi alt boyutları ve SYBD toplam puanlarının medeni duruma göre istatistiksel olarak anlamlı farklılık gösterdiği ($p<.05$); SYBD alt boyutları ve toplam puanlarının çocuk sahibi olma duruma göre istatistiksel olarak anlamlı farklılık gösterdiği tespit edilmiştir ($p<.05$). Sonuç olarak, COVID-19 döneminde belediye çalışanlarının FA düzeyleri arttıkça hem SYBD tüm alt boyutlarının hem de SYBD toplam puanlarının artacağı gözlemlenmiştir. Bu durum, FA düzeylerinin SYBD üzerindeki etkisini ortaya koymaktadır.

Anahtar kelimeler: Belediye çalışanları, Fiziksel aktivite, Sağlıklı yaşam biçimi

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INTRODUCTION

Today, the concept of health encompasses an understanding that includes health services that protect the lives of individuals, families, and society, ensuring their continuity and supporting their development. The essence of this understanding is based on individuals living a healthy life, as well as acquiring behaviors that will ensure the continuation of this health and making the right decisions about their health (Çimen, 2003). Although today's technological developments seem to have the potential to increase the quality of healthy life, the facts behind these innovations are that they result in a decrease in the frequency of daily activities, an increase in physical movement restrictions, and an increase in the number of inactive individuals in the long term. This situation has negative effects on the health of individuals and society. Inactivity, which is a sedentary lifestyle, manifests itself in modern society in the form of behaviors such as meeting daily needs from computers, virtual environments, or markets. This phenomenon constitutes a significant problem and disadvantage for society (Bozkuş et al, 2013). During the COVID-19 pandemic, a large part of society was living in isolation at home due to curfews. In this context, it cannot be ignored that physical activity programs specially designed for individuals and personnel who must work for long periods in closed areas such as municipalities and similar institutions where they work behind a desk will support the immune system and reduce the negative effects on the physical, mental, psychological and spiritual health of individuals. In addition, the contribution of the above-mentioned physical activity and sports exercises to reducing and eliminating the factors that increase mortality rates by becoming a part of life is also remarkable. It is understood that physical activity has significant positive effects on mental, spiritual, and general health in reducing the morbidity and negative effects on the immune system of severe symptoms that may occur after contracting COVID-19 (Kaya-Ciddi and Yazgan, 2020). One of the main consequences and most important factors of the COVID-19 outbreak is the decrease in serum ferritin levels (Mattioli et al, 2020). Individuals who must stay at home, at work, and in various institutions for long periods have increased inactive behavior and lifestyles, resulting in decreased energy expenditure and decreased metabolic rate. The combination of all these factors has led to the emergence of chronic diseases, the progression of these diseases, the development of muscle atrophy, muscle loss, and even muscle wasting. In addition, this situation has caused the immune system to weaken and has posed vital risks (Barozzoni et al., 2020). It has been determined that physical activity increases the level of satiety hormones and decreases the concentration of the hunger hormone ghrelin. However, it should not be ignored that there may be variable effects on satiety hormones depending on the type, intensity, and time of exercise (Yücel, 2019). The protective, preventive, and therapeutic effects of physical activity against certain non-communicable diseases such as obesity have been proven. However, over time, the quality of life, comfort, and convenience levels increase. With technological developments, various sports branches and activities such as cycling, leisure activities (recreation), Zumba, Pilates, dance, and yoga have been added to individuals' physical activities. However, because of the rapid spread of COVID-19, governments, state and local

governments have had to ban most of these activities to protect public health. This has led to a decrease in physical activity and therefore to the problem of inactivity (Mattioli et al, 2020). To reduce the inactivity caused by these reasons and to protect our health, it has become mandatory to perform physical activities. In the home environment, considering the current conditions and environmental factors, it is essential to apply breathing exercises that do not pose a risk, increase muscle strength, and aim to protect it, combined with conditioning training and respiratory activities for a healthy life. In line with the information stated above, this study was conducted to determine the effect of physical activity levels of municipal employees on Healthy Lifestyle Behaviors during the COVID-19 Pandemic Period.

METHOD

Research Model

In this study, the relational screening model was used to analyze the relationships between variables. The relational screening model is a widely preferred research method to determine whether there is a relationship between two or more variables and, if so, the direction and degree of this relationship.

Research Group

The research group of this study consists of volunteer individuals between the ages of 18 and 65 who work in various directorates and positions affiliated with Bornova Municipality such as press and publication, social assistance, police, veterinary, parks and gardens, financial services, zoning, legal affairs, support services, cultural and social affairs, and security. Within the scope of our study, surveys were applied to a total of 368 employees from the above-mentioned universe and these data were included in the sample.

Ethical Approval

Balıkesir University Ethics Committee Commission approval was received for the study (Date: 22.09. 2021; Number: E-94025189-050.03-68271.

Data Collection Tools

In the data and analysis collection phase, a "personal information form" was prepared under the supervision of the researchers as the data analysis tool of the study. The International Physical Activity Questionnaire (Craig et al., 2003) was used to determine the physical activity level of the participants. In addition, the Healthy Lifestyle Behaviors Scale II was preferred to determine healthy lifestyle behaviors. The validity and reliability study of the International Physical Activity Questionnaire in Turkey was conducted by Öztürk in (2005). In our study, a short questionnaire consisting of seven questions covering the last week was used to assess the level of physical activity. The total score of the short form includes the sum of walking, moderate-

intensity activity duration (minutes), and frequency (days) of vigorous activity. The sitting score is calculated separately. The content of the questionnaire includes questions regarding physical activity performed for at least ten minutes in the last week. The total score is expressed with the "MET-minutes/week" criterion obtained by multiplying minutes, days, and MET (metabolic equivalent) values. In calculating walking and step scores, walking time (minutes) was multiplied by 3.3 METs. In the calculation, 4 METs were used for moderate-intensity activity and 8 METs were used for vigorous activity. Physical activity levels were classified as physically passive (3000 MET-min/week) (Craig et al, 2003).

The Healthy Lifestyle Behaviors Scale was reorganized in 1996 and named as the "Healthy Lifestyle Behaviors Scale II" (Walker et al., 1987). The validity and reliability studies of the scale were carried out by Bahar et al. (2008) and it was adapted to Turkish. The Healthy Lifestyle Behaviors Scale is a Likert-type scale that is evaluated between 1-4 points. The scoring system of the scale is measured with the expressions 1) never, 2) sometimes, 3) often, 4) regularly. In addition, the scale consists of a total of 52 items and six sub-factors. These sub-factors were spiritual development, health responsibility, physical activity (PA) and exercise, nutrition, interpersonal relations, and stress management. The item numbers and the meanings of the sub-dimensions in the survey are listed below: Health Responsibility (3, 9, 15, 21, 27, 33, 39, 45, and 51), PA and Exercise (4, 10, 16, 22, 28, 34, 40, and 46), Spiritual Development (6, 12, 18, 24, 30, 36, 42, 48, and 52), Nutrition (2, 8, 14, 20, 26, 32, 38, 44, and 50), Interpersonal Relations (1, 7, 13, 19, 25, 31, 37, 43, and 49) and Stress Management (5, 11, 17, 23, 29, 35, 41, and 47).

Data Collection

All data collection tools, and equipment were collected through digital communication tools such as e-mail and WhatsApp due to the pandemic process, hygiene rules, justification, and isolation obligation. The data of the study was collected between 22.10. 2021 and 22.04.2022 It took 6 months in total.

Data Analysis

The data collected from the participants via Google Form were first checked one by one and transferred to Excel. Here, the results were numerically coded and transferred to the SPSS program. First, descriptive statistics and normality analyses were applied to the data. In normality analyses, skewness and kurtosis values were checked. As a result of the analysis, it was determined that the data were in the range of ±2. It was determined that the determined values were suitable for normal distribution. In this context, independent groups t-test, one-way analysis of variance (ANOVA) and Person correlation analyses were used from parametric tests in the analysis of the data.

RESULTS

Table 1. Comparison results of participants' PA scores according to demographic information

Variable	**Marital Status**	N	$\overline{X}$	SD	t	p	Difference
Physical Activity	Married	231	2287,93	1899,79	-3,21	**,01****	
	Single	137	3065,98	2434,53			
	Child Status	N	$\overline{X}$	SD	t	p	
	Yes	187	2236,76	1985,53	-3,13	**,01****	
	No	181	2929,71	2249,45			
	Occupation Groups	N	$\overline{X}$	SD	F	p	
	Civil Servant[a]	26	1434,46	1259,06	2,79	**,04***	d>a
	Contracted Personnel[b]	49	2699,72	2171,75			
	Permanent Worker[c]	41	2490,40	2496,51			
	Personnel Inc.[d]	252	2685,96	2126,42			

***p< ,05; **p< ,01**

In Table 1, it was determined that the participants' PA scores showed a statistically significant difference according to their marital and child status (p< ,01). It was determined that the PA scores showed a statistically significant difference according to their occupational groups (p< ,05). According to the post-doc Scheffe results conducted to determine the source of the difference between occupation groups; it was determined that the average score of the Personnel Inc. group was significantly higher than the PA average score of the civil servants.

Table 2. Results of the relationship between the participants' PA and HLB scores and their ages

Variables			Age
HLB Sub-dimensions	**Health Responsibility**	r	-,16
		p	**,01****
	PA	r	-,20
		p	**,01****
	Nutrition	r	-,16
		p	**,02***
	Spiritual Development	r	-,11
		p	**,04***
	Interpersonal Relationships	r	-,16
		p	**,03***
	Stress Management	r	-,12
		p	**,03***
HLB		r	-,17
		p	**,01****
PA		r	-,20
		p	**,01****

***p< ,05; **p< ,01**

In Table 2, a low-level, statistically significant negative correlation was found between the participants' PA and HLB scores and their ages (p< ,05; p< ,05).

Table 3. Comparison results of participants' HLB scores according to marital status

Variables	Marital Status	n	$\overline{X}$	SD	t	p
Health Responsibility	Married	231	21,23	5,18	-,92	,36
	Single	137	21,76	5,75		
PA	Married	231	17,58	5,24	-3,91	**,00****
	Single	137	19,99	5,97		
Nutrition	Married	231	21,10	5,28	-2,58	**,01***
	Single	137	22,62	5,76		
Spiritual Development	Married	231	26,32	4,32	-1,64	,10
	Single	137	27,10	4,67		
Interpersonal Relationships	Married	231	25,20	4,21	-1,11	,27
	Single	137	25,73	4,72		
Stress Management	Married	231	20,65	4,23	-3,18	**,00****
	Single	137	22,12	4,46		
HLB	Married	231	132,07	24,61	-2,63	**,01***
	Single	137	139,33	27,08		

****p< ,01**

In Table 3, it was determined that the participants' PA (p< ,01), nutrition (p< ,05), stress management (p< ,01) sub-dimensions, and HLB total scores (p< ,05) from the SYBD sub-dimensions showed statistically significant differences according to marital status.

Table 4. Comparison results of participants' HLB scores according to their childbearing status

Variables	Child Status	n	$\overline{X}$	SD	t	p
Health Responsibility	Yes	187	20,18	4,00	-4,58	**,01****
	No	181	22,71	6,30		
PA	Yes	187	16,76	4,16	-6,21	**,01****
	No	181	20,26	6,38		
Nutrition	Yes	187	20,48	4,30	-4,29	**,01****
	No	181	22,90	6,30		
Spiritual Development	Yes	187	25,97	3,99	-2,82	**,01****
	No	181	27,27	4,82		
Interpersonal Relationships	Yes	187	24,68	3,67	-3,19	**,01****
	No	181	26,14	4,96		
Stress Management	Yes	187	20,06	3,49	-5,20	**,01****
	No	181	22,36	4,87		
HLB	Yes	187	128,13	18,32	-5,16	**,01****
	No	181	141,64	30,21		

****p< ,01**

In Table 4, it was determined that the participants' HLBS sub-dimensions and total scores showed statistically significant differences according to their childbearing status (p< ,01).

Table 5. Comparison results of participants' HLB scores according to their smoking/alcohol use status

Variables	Smoking/Alcohol Usage	n	$\overline{X}$	SD	t	p
Health Responsibility	Yes	200	21,01	5,52	-1,13	,10
	No	168	21,92	5,23		
PA	Yes	200	17,90	5,77	-2,17	**,03***
	No	168	19,17	5,41		
Nutrition	Yes	200	20,97	5,51	-2,69	**,01****
	No	168	22,50	5,40		
Spiritual Development	Yes	200	26,28	4,57	-1,55	,12
	No	168	27,00	4,32		
Interpersonal Relationships	Yes	200	25,21	4,40	-,92	,36
	No	168	25,63	4,41		
Stress Management	Yes	200	21,01	4,51	-,89	,38
	No	168	21,42	4,20		
HLB	Yes	200	132,37	26,13	-1,97	,06
	No	168	137,64	25,09		

***p< ,05; **p< ,01**

In Table 5, it was determined that the participants' PA (p< ,05) and nutrition (p< ,01) sub-dimensions of the HLB sub-dimensions showed statistically significant differences according to their smoking/alcohol use status.

Table 6. Comparison results of participants' HLB scores according to the type of residence they live in

Variables	Living Housing	n	$\overline{X}$	SD	t	p
Health Responsibility	Private	71	20,31	4,70	-1,94	,06
	Apartment House	297	21,69	5,53		
PA	Private	71	18,15	5,53	-,54	,59
	Apartment House	297	18,56	5,67		
Nutrition	Private	71	21,30	4,99	-,63	,53
	Apartment House	297	21,75	5,62		
Spiritual Development	Private	71	25,46	4,70	-2,42	**,02***
	Apartment House	297	26,88	4,37		
Interpersonal Relationships	Private	71	24,20	4,27	-2,58	**,01****
	Apartment House	297	25,69	4,40		
Stress Management	Private	71	20,28	4,24	-1,97	,06
	Apartment House	297	21,41	4,38		
HLB	Private	71	129,70	24,01	-1,85	,07
	Apartment House	297	135,99	26,05		

***p< ,05; **p< ,01**

In Table 6, it was determined that the participants' scores on the spiritual development (p< ,05) and interpersonal relationships (p< ,01) sub-dimensions of HLB showed statistically significant differences according to the type of residence they lived in.

Table 7. Comparison results of participants' HLB scores according to their BMI status

Variables	BMI	n	$\overline{X}$	SD	F	p	Difference
Health Responsibility	Normal Weight[a]	211	21,99	6,15	3,05	**,04***	a>b
	Overweight[b]	136	20,53	4,09			
	Obese[c]	21	21,57	4,07			
PA	Normal Weight[a]	211	19,05	6,31	2,87	,06	
	Overweight[b]	136	17,57	4,34			
	Obese[c]	21	18,67	5,45			
Nutrition	Normal Weight[a]	211	22,02	6,23	1,82	,16	
	Overweight[b]	136	20,97	4,35			
	Obese[c]	21	22,57	3,89			
Spiritual Development	Normal Weight[a]	211	26,86	4,63	1,23	,29	
	Overweight[b]	136	26,40	3,87			
	Obese[c]	21	25,43	6,01			
Interpersonal Relationships	Normal Weight[a]	211	25,74	4,73	1,53	,22	
	Overweight[b]	136	24,96	3,78			
	Obese[c]	21	24,81	4,66			
Stress Management	Normal Weight[a]	211	21,91	4,71	7,50	**,00****	a>b
	Overweight[b]	136	20,08	3,42			
	Obese[c]	21	21,24	5,00			
HLB	Normal Weight[a]	211	137,57	29,28	3,15	**,04***	a>b
	Overweight[b]	136	130,51	18,47			
	Obese[c]	21	134,29	25,86			

***p< ,05; **p< ,01**

In Table 7, it was determined that the participants' HLB sub-dimensions; health responsibility, stress management sub-dimensions, and HLB total scores showed statistically significant differences according to their BMI status (p< ,01). According to the post-hoc Scheffe results conducted to determine the source of the difference; it was determined that the mean score of those with normal weight was significantly higher than the mean score of those who were obese in health responsibility, stress management and HLB total scores (p< ,05).

Table 8. Comparison results of participants' HLB scores according to occupational groups

Variables	Occupation Group	n	$\overline{X}$	SD	F	p	Difference
Health Responsibility	Civil Servant[a]	26	21,23	5,94	2,80	**,04***	b>d
	Contracted Personnel[b]	49	23,47	6,07			
	Permanent Worker[c]	41	20,80	4,72			
	Personnel Inc.[d]	252	21,15	5,25			
PA	Civil Servant[a]	26	18,54	5,89	1,41	,24	
	Contracted Personnel[b]	49	20,00	5,98			
	Permanent Worker[c]	41	18,39	5,25			
	Personnel Inc.[d]	252	18,19	5,59			
Nutrition	Civil Servant[a]	26	23,19	4,94	3,40	**,02***	b>d
	Contracted Personnel[b]	49	23,57	5,66			
	Permanent Worker[c]	41	21,51	5,29			
	Personnel Inc.[d]	252	21,16	5,48			
Spiritual Development	Civil Servant[a]	26	26,46	5,56	4,00	**,01****	b>c
	Contracted Personnel[b]	49	27,06	5,35			
	Permanent Worker[c]	41	24,39	5,20			
	Personnel Inc.[d]	252	26,90	3,92			

***p< ,05; * *p< ,01**

Table 8 (Continue). Comparison results of participants' HLB scores according to occupational groups

Variables	Occupation Group	n	$\overline{X}$	SD	F	p	Difference
Spiritual Development	Civil Servant[a]	26	26,46	5,56	4,00	**,01****	b>c
	Contracted Personnel[b]	49	27,06	5,35			
	Permanent Worker[c]	41	24,39	5,20			
	Personnel Inc.[d]	252	26,90	3,92			
Interpersonal Relationships	Civil Servant[a]	26	25,46	5,47	3,21	**,02***	d>c
	Contracted Personnel[b]	49	25,96	5,09			
	Permanent Worker[c]	41	23,44	4,66			
	Personnel Inc.[d]	252	25,60	4,03			
Stress Management	Civil Servant[a]	26	20,92	4,82	1,43	,24	
	Contracted Personnel[b]	49	21,10	5,73			
	Permanent Worker[c]	41	19,95	4,35			
	Personnel Inc.[d]	252	21,44	4,00			
HLB	Civil Servant[a]	26	135,81	27,96	1,86	,14	
	Contracted Personnel[b]	49	141,16	30,59			
	Permanent Worker[c]	41	128,49	26,61			
	Personnel Inc.[d]	252	134,45	24,21			

***p< ,05; * *p< ,01**

In Table 8, it was determined that the participants' HLB sub-dimensions; health responsibility (p< ,05), nutrition (p< ,05), spiritual development (p< ,05), and interpersonal relations (p< ,01) sub-dimensions scores showed statistically significant differences according to occupational groups. According to the post-hoc Scheffe results conducted to determine the source of the difference, it was determined that the average score of the contracted personnel in the health responsibility and nutrition dimension was significantly higher than the average score of the Personnel Inc. group; the average score of the contracted personnel in the spiritual development dimension was significantly higher than the average score of the permanent workers, and the average score of the Personnel Inc. group was significantly higher than the average score of the permanent workers in the interpersonal relations dimension.

Table 9. Comparison results of participants' HLB scores according to their social security status

Variables	Social Security	n	$\overline{X}$	SD	F	p	Difference
Health Responsibility	SSK[a]	138	21,09	4,84	1,77	,17	
	Pension fund[b]	23	19,87	4,37			
	SGK[c]	207	21,82	5,81			
PA	SSK[a]	138	18,17	4,94	,89	,41	
	Pension fund[b]	23	17,48	5,02			
	SGK[c]	207	18,80	6,12			
Nutrition	SSK[a]	138	21,82	4,52	,43	,65	
	Pension fund[b]	23	22,48	5,04			
	SGK[c]	207	21,47	6,13			
Spiritual Development	SSK[a]	138	25,86	4,46	4,20	**,02***	c>a
	Pension fund[b]	23	25,83	5,11			
	SGK[c]	207	27,20	4,32			

***p< ,05; **p< ,01**

Table 9 (Continue). Comparison results of participants' HLB scores according to their social security status

Variables	Social Security	n	$\overline{X}$	SD	F	p	Difference
Interpersonal Relationships	SSK[a]	138	25,09	4,19	1,27	,28	
	Pension fund[b]	23	24,52	5,12			
	SGK[c]	207	25,70	4,46			
Stress Management	SSK[a]	138	19,88	4,32	14,12	**,00****	c>a,b
	Pension fund[b]	23	19,83	4,00			
	SGK[c]	207	22,23	4,18			
HLB	SSK[a]	138	131,91	22,25	2,19	,11	
	Pension fund[b]	23	130,00	23,87			
	SGK[c]	207	137,21	27,89			

***p< ,05; **p< ,01**

In Table 9, it was determined that the participants' HLB sub-dimensions; spiritual development (p< ,05) and stress management (p< ,01) sub-dimensions showed a statistically significant difference according to their social security status. According to the post-hoc Scheffe results conducted to determine the source of the difference; in the spiritual development dimension, the average score of those with SGK security was significantly higher than the average score of those with SSK security; in the stress management dimension, the average score of those with SGK security was significantly higher than the average score of those with retirement fund and SSK security.

Table 10. Comparison results of participants' HLB scores according to their educational status

Variables	Education Level	n	$\overline{X}$	SD	F	p	Difference
Health Responsibility	Primary education[a]	54	20,74	3,30	,93	,43	
	High school[b]	146	21,22	5,87			
	Licence[c]	143	21,66	5,67			
	Postgraduate[d]	25	22,72	4,47			
PA	Primary education[a]	54	17,30	3,74	2,42	,07	
	High school[b]	146	18,29	6,18			
	Licence[c]	143	18,71	5,74			
	Postgraduate[d]	25	20,84	4,51			
Nutrition	Primary education[a]	54	20,72	4,17	3,23	**,02***	d>a
	High school[b]	146	21,31	6,11			
	Licence[c]	143	21,87	5,32			
	Postgraduate[d]	25	24,60	4,43			
Spiritual Development	Primary education[a]	54	24,46	4,29	5,49	**,01****	b,c,d>a
	High school[b]	146	26,69	4,33			
	Licence[c]	143	27,17	4,28			
	Postgraduate[d]	25	27,52	5,37			
Interpersonal Relationships	Primary education[a]	54	23,56	3,67	4,44	**,01****	c>a
	High school[b]	146	25,36	4,49			
	Licence[c]	143	26,07	4,33			
	Postgraduate[d]	25	25,76	4,84			
Stress Management	Primary education[a]	54	20,00	3,22	2,57	,06	
	High school[b]	146	21,64	4,62			
	Licence[c]	143	20,99	4,39			
	Postgraduate[d]	25	22,36	4,48			
HLB	Primary education[a]	54	126,78	18,17	3,02	**,03***	d>a
	High school[b]	146	134,51	28,51			
	Licence[c]	143	136,49	25,06			
	Postgraduate[d]	25	143,80	23,29			

***p< ,05; **p< ,01**

In Table 10, it was determined that the participants' HLB sub-dimensions; nutrition (p< ,05), spiritual development (p< ,01), interpersonal relations (p<,01) sub-dimensions and HLB total scores (p< ,05) showed statistically significant differences according to their educational status. According to the Post Hoc (SCHEFFE) results conducted to determine the source of the difference; in the nutrition dimension, the average score of those with a postgraduate education level was significantly higher than the average score of those with a primary school education level; in the spiritual development dimension, the average score of those with a high school, undergraduate and postgraduate education level was significantly higher than the average score of those with a primary school education level; in the interpersonal relations dimension, the average score of those with a bachelor's education level was significantly higher than the average score of those with a primary school education level; in HLB total scores, the average score of those with a postgraduate education level was significantly higher than the average score of those with a primary school education level.

Table 11. Results of the relationship between participants' PA scores and HLB

Variables			**PA**
HLB Sub-Dimensions	**Health Responsibility**	r	,38
		p	**,01****
	PA	r	,52
		p	**,01****
	Nutrition	r	,44
		p	**,01****
	Spiritual Development	r	,30
		p	**,01****
	Interpersonal Relationships	r	,35
		p	**,01****
	Stress Management	r	,39
		p	**,01****
HLB Total Score		r	,46
		p	**,01****

****p< ,01**

In Table 11, positive moderately significant relationships were found between the participants' PA scores and the HLB sub-dimensions; health responsibility, PA, nutrition, spiritual development, inter-personal relationships, stress management sub-dimensions and HLB total scores (p< ,01).

DISCUSSION AND CONCLUSION

According to the findings of this study conducted to examine the effect of PA levels of municipal employees on HLB during the COVID-19 Pandemic period; Statistically negative low-level significant relationships were found between the participants' PA scores and their ages (p<.05). Therefore, as age increased, PA levels decreased, and as age decreased, PA levels increased.

Burton and Turrell (2000) stated that there is a negative relationship between age and PA level and that PA level decreases with increasing age. In a study conducted in Brazil, it was determined that 41.1% of participants over the age of 20 and 38% of individuals in the 20-29 age group were inactive (Hallal et al., 2003).

When the effects of marital status on PA levels were examined in the study, a significant difference was observed. It was determined that single individuals had higher PA levels compared to married individuals ($p<.05$). Deniz (2011) and Özüdoğru (2013) similarly stated that married individuals had lower emotional intelligence PA levels compared to single individuals. These findings support the results of our study and can be explained by the fact that single individuals are younger and more dynamic.

In the study, it was found that the PA levels of the participants who did not have children were significantly higher than the participants who did ($p<.05$). Esen (2010) stated that the PA levels of women who had children were lower, while Tammelin et al. (2003) suggested that not having children was related to the women's inability to do physical activity. Memiş and Yıldıran (2007) found no significant difference in PA levels between individuals with and without children and evaluated the PA levels of both groups as "low". These results contradict our study. As a result of the research, it was determined that the PA scores of the participants showed significant differences according to their occupational groups ($p<.05$). The PA score average of the Personnel Inc. group was found to be significantly higher than the average score of civil servants. Şimşek (2020), in his study with high school students, revealed that the PA scores of worker mothers were lower than those of civil servant mothers. These findings support the results of our research and show that civil servants are more active. Ergin et al. (2016) found no significant difference between smoking and PA levels; this finding is consistent with our study. On the other hand, Savcı et al. (2006) found that total PA and walking scores of non-smoking students were higher than those of smokers. This finding is contradictory to our study.

In the studies conducted by Raustorp et al. (2004) and Hallal et al. (2003), no relationship was found between BMI and PA values measured by pedometer; this situation is similar to the findings of our study. On the other hand, Aktaş et al. (2015) stated that the PA levels of individuals with a high level of education were sufficient. On the other hand, Önemli (2020) observed a significant difference between the PA levels of women and their educational status. However, these findings do not coincide with the results of our study.

In our study, a negative, low-level statistically significant relationship was found between the participants' HLB scores and their ages ($p<.05$). In his study conducted in Isparta, Özçelik (2012) stated that the scores obtained from the self-actualization, health responsibility and interpersonal support sub-dimensions decreased with age, but this difference was not statistically significant. On the other hand, Thanavaro et al. (2006) did not find any relationship between persistent illness behaviors and age in their study conducted in the USA. These findings contradict the

results of our study. In our study, it was determined that the participants' HLB sub-dimensions PA, nutrition, stress management and total HLB scores exhibited statistically significant differences according to their marital status ($p<.05$). Our study revealed that single participants had higher scores than married individuals in certain sub-dimensions. In the literature, it was stated that the mean scores of married individuals in the HLB sub-dimension PA were lower than single individuals (Kolaç et al., 2018; Güner and Demir, 2006). In addition, Yanık and Noğay (2017) found that single individuals had higher PA, stress management, and total HLB scores than married individuals. These findings are consistent with the results of our study.

In our study, it was determined that the participants' health responsibility, spiritual development, interpersonal relations sub-dimensions, and HLB total scores did not show a significant difference according to marital status ($p<.05$). Similar studies have reached the same conclusion (Ahijevych and Bernhard, 1994; Sayan and Erci, 2001; Zincir et al., 2003). However, Yanık and Noğay (2017) stated that single individuals had higher health responsibility and spiritual development scores than married individuals. These findings contradict the results of our study.

In the study, it was determined that the participants' HLB sub-dimensions and total scores showed significant differences depending on the status of having children ($p<.05$). In the studies conducted, it was observed that the scores of individuals who did not have children were higher. In a study conducted on nurses, it was emphasized that those who did not have children had higher levels of stress management and spiritual development (Cürcani et al., 2010; Özkan and Yılmaz, 2008). Similarly, among factory workers, it was determined that individuals who did not have children had higher PA mean scores. These findings are consistent with our study. However, other studies on academic staff and elderly care homes provide different results (Güler et al., 2008; Tambağ, 2010).

According to the research findings, it was determined that the participants' PA and nutrition scores from the HLB sub-dimensions showed significant differences depending on their smoking and alcohol use status ($p<.05$). Studies have shown that smoking and alcohol usage harm individuals' nutrition scores. Vural and Bakır (2015) emphasized that individuals who do not smoke or drink alcohol have higher nutrition scores. Similarly, Özkan and Yılmaz (2008) and Ayaz et al. (2005) also found that non-smokers have higher nutrition scores. Although no significant relationship was found between certain sub-dimensions and smoking and alcohol use in our study, it is seen that healthy eating habits and PA direct individuals to be more careful in smoking and alcohol use.

According to the research findings, significant differences were observed in the participants' spiritual development and interpersonal communication sub-dimensions according to the type of residence ($p<.05$). In a study, it was determined that municipality employees living in apartments received higher scores in terms of spiritual development and inter-personal relations compared to those living in detached houses. However, no significant difference was found between the total

scores such as health responsibility PA, nutrition, stress management, and health management. Yuvakgil (2017) found a significant difference between the type of residence and health responsibility of elderly individuals, while Tambağ (2010) did not find a significant difference in terms of health management between individuals living in nursing homes and having children. The results of these studies partially overlap with the findings of our current study.

According to the research findings, significant differences were observed between the participants' health responsibility, stress management sub-dimensions, and general HLB scores according to their BMI status ($p<.05$), However, no significant difference was observed in the areas of PA, nutrition, spiritual development and interpersonal relations. The study conducted by Pasinlioğlu and Gözüm (1998) is also parallel to these results. In a study conducted by Cihangiroğlu and Deveci (2011), no relationship was found between the students' BMI and HLB total scores.

According to the research findings, significant differences were observed between the participants' scores in sub-dimensions such as health responsibility, nutrition, spiritual development and interpersonal relations according to their occupational groups ($p<.05$), However, no significant difference was found in the total scores of PA, stress management and HLB. The findings show that the contract personnel had higher health responsibility, nutrition and spiritual development scores, and the Personnel Inc. group performed better than permanent workers in interpersonal relations. These results were not found in the study conducted by Yanık and Noğay (2017).

According to the research findings, a significant difference was observed in terms of participants' spiritual development and stress management scores according to social security status ($p<.05$), but no difference was found between the total scores of health responsibility, PA, nutrition, interpersonal relations, and social competence skills. Polat and Kahraman (2013) also did not find a significant difference between social security status and social competence skills subgroups; this finding partially supports the results of our research.

According to the research findings, significant differences were found between the participants' nutrition, spiritual development, interpersonal relations, and HLB total scores depending on their educational status ($p<.05$). The studies conducted to shed light on the relationship between the participant's level of education and their healthy behaviors. Participants with high school, undergraduate, and postgraduate education levels obtained higher scores compared to participants with primary school levels. Studies conducted by Özkan and Yılmaz (2008) and Geçkil and Yıldız (2006) also reveal similar results. However, in a study conducted by Güner and Demir (2003), no relationship was found between education and support scores; this situation creates a contradiction with the current findings. As a result, it can be said that increasing the level of education has positive effects on nutrition, spiritual development, interpersonal relations, and healthy life behaviors.

The research findings show that there are positive moderately significant relationships between PA scores and HLB sub-dimensions ($p<.05$). It is observed that as the total MET score increases, the scores of all HLB sub-dimensions also increase. The results of Zhu et al. (2019), Toktaş et al. (2018), Şimşek (2020), and other studies have revealed similar positive relationships between PA and HLB. In addition, in the studies of Söyleyici (2018) and Özkan et al. (2013), significant differences were found in group means according to MET classes. However, Söyleyici (2018) did not find a significant difference with PA in personal relationships, which contradicts the findings of our study.

CONCLUSION

The research findings revealed that PA and HLB decrease with age. On the other hand, it was determined that PA and HLB levels of municipality personnel who are single, childless, and working under contract are higher. In addition, it was determined that PA levels are independent of smoking and alcohol use, housing type, BMI, and social security type. Increasing education level has a positive effect on HLB sub-dimensions such as nutrition, spiritual development, and interpersonal relationships. It was observed that the increase in PA levels has a positive effect on all sub-dimensions of the HLB scale; it especially improves stress management and eating habits. These findings show that increasing PA levels and encouraging HLB play a critical role in supporting the general health and quality of life of employees under extraordinary conditions such as pandemics.

Suggestions

In line with the findings obtained from this study, it is recommended that more comprehensive research be conducted on PA and HLB. During epidemic periods, interdisciplinary studies at the national level are important for the protection of PA and HLB. Corrective training programs should be established to improve the health of municipal employees and should be adapted to their working conditions. In addition, the opinions of employees should be taken into account in the projects, and sports centers and health support areas should be planned in the regions where employees live. Awareness studies should be carried out to increase PA levels in the municipality, and projects promoting sports and health should be increased.

Conflict of Interest: There is no personal or financial conflict of interest within the scope of the study.

Declaration of Contribution of Researchers: Research Design by M.G, and S.Ç; Statistical Analysis; Manuscript Preparation by M.G, M.M, F.S Data Collection by S.Ç.

Information on Ethics Committee Permission
Board Name: Balıkesir University Ethics Committee Commission approval was received for the study
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REFERENCES

Ahijevych, K., & Bernhard, L. (1994). Health promoting behaviors of African American women. *Nursing Research, 43*(2), 86-89.

Aktaş, H., Şaşmaz, C. T., Kılınçer, A., Mert, E., Gülbol, S., Külekçioğlu, D., ... & Demirtaş, A. (2015). Yetişkinlerde fiziksel aktivite düzeyi ve uyku kalitesi ile ilişkili faktörlerin araştırılması. *Mersin Üniversitesi Sağlık Bilimleri Dergisi, 8*(2), 60-70.

Arabacı, R., & Çankaya, C. (2007). Investigation of physical activity levels of physical education teachers. *Journal of Uludag University Faculty of Education, 20*(1), 1-15.

Ayaz, S., Tezcan, S., & Akıncı, F. (2005). Health promotion behavior of nursing school students. *Journal of Cumhuriyet University School of Nursing, 9*(2), 26-34. https://doi.org/10.4236/jbm.2017.59005

Bahar, Z., Beser, A., Gordes, N., Ersin, F., & Kıssal, A. (2008). Validity and reliability study of the healthy lifestyle behaviors scale II. *Journal of Cumhuriyet University School of Nursing, 12*(1), 1-13. https://doi.org/10.12691/ajnr-3-2-2

Barazzoni, R., Bischoff, S. C., Breda, J., Wickramasinghe, K., Krznaric, Z., Nitzan, D., ... & Singer, P. (2020). Espen expert statements and practical guidance for nutritional management of individuals with sars-cov-2 infection. *Clinical Nutrition, 39*(6), 1631-1638. https://doi.org/10.1016/j.clnu.2020.03.022

Burton, N. W., & Turrell, G. (2000). Occupation, hours worked, and leisure-time physical activity. *Preventive Medicine, 31*(6), 673-681. https://doi.org/10.1006/pmed.2000.0763

Cihangiroğlu, Z., Deveci, S.E. (2011). Fırat üniversitesi elazığ sağlık yüksekokulu öğrencilerinin sağlıklı yaşam biçimi davranışları ve etkiyen faktörler. *Fırat Tıp Dergisi, 16*(2), 78-83.

Craig, C. L., Marshall, A. L., Sjöström, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., ... & Oja, P. (2003). International physical activity questionnaire: 12-country reliability and validity. *Medicine & Science in Sports & Exercise, 35*(8), 1381-1395. https://doi.org/ 10.1249/01.MSS.0000078924.61453.FB

Cürcani, M., Tan, M., & Özdelikara, A. (2010). Hemşirelerin sağlıklı yaşam biçimi davranışları ve etkileyen faktörlerin belirlenmesi. *TAF Preventive Medicine Bulletin, 9*(5) 487-490.

Çimen, S (2003). *Development of a scale of risky health behaviors in 15-18 age group youth*. Unpublished Doctoral Thesis. Istanbul.

Deniz, M. (2011). *Investigation of the relationship between physical activity level and socioeconomic status in adults.* Master's Thesis, Bursa; Uludağ University, Institute of Health Sciences, Department of Physical Education and Sports.

Ergin, Ç., Yurdalan, S. U., Demirbüken, İ., & Zengin, O. (2016). Fatigue and physical activity levels of smoking and non-smoking healthy sedentary individuals. *Clinical and Experimental Health Sciences, 6*(2), 51-55.

Esen, H. T. (2010). *Evaluation of physical activity levels of female teachers working in primary and secondary schools affiliated to national education in Karaman city center,* Master's Thesis.

Geçkil, E., & Yıldız, S. (2006). The effect of nutrition and coping with stress education on adolescents' health promotion. *Cumhuriyet Üniv. Hem Yüks Derg., 10,* 19-28.

Güler, G., Güler, N., Kocataş, S., Yıldırım, F., & Akgül, N. (2008). Bir üniversitede çalışan öğretim elemanlarının sağlıklı yaşam biçimi davranışları. *CÜ Hemşirelik Dergisi, 12*(3), 18-26.

Güner, İ.C., & Demir, F. (2006). Determination of healthy lifestyle behaviors of operating room nurses. *Anatolian Journal of Nursing and Health Sciences, 9*(3), 17-25.

Hallal, P. C., Victora, C. G., Wells, J. C. K., & Lima, R. D. C. (2003). Physical inactivity: prevalence and associated variables in brazilian adults. *Medicine and Science in Sports and Exercise*, *35*(11), 1894-1900. https://doi.org/10.1249/01.mss.0000093615.33774.0e

Kaya- Ciddi, P., & Yazgan, E. (2020). Covid-19 salgınında sosyal izolasyon sırasında fiziksel aktivite durumunun yaşam kalitesi üzerine etkisi. *Istanbul Commerce University Journal of Social Sciences, 19*(37) 262 - 279.

Kolaç, N., Balcı, A. S., Şişman, F. N., Ataçer, B. E., & Dinçer, S. (2018). Fabrika çalışanlarında sağlıklı yaşam biçimi davranışı ve sağlık algısı. *Bakırköy Tıp Dergisi*, *14*(3), 267-274. https://doi.org/10.5350/BTDMJB.20170328092601

Mattioli, A. V., & Ballerini-Puviani, M. (2020). Lifestyle at time of covid-19: how could quarantine affect cardiovascular risk. *American Journal of Lifestyle Medicine*, *14*(3), 240-242. https://doi.org/10.1177/1559827620918808

Memiş, U. A., & Yıldıran, İ. (2007). Determination of physical activity levels of instructors and investigation of some variables. *Gazi Journal of Physical Education and Sport Sciences*, *12*(3), 11-24.

Önemli, E. (2020). *Physical activity levels of female trainees in a public education center, their views on physical activity and determination of exercise behavior change stages*, Master's Thesis.

Özçelik, H. (2012). E*valuation of healthy lifestyle behaviors of some professional members of the society pioneer working in isparta city center.* Süleyman Demirel University, Institute of Health Sciences, Master's Thesis, Isparta.

Özkan, A., Bozkuş, T., Kul, M., Türkmen, M., Ümit, Ö. Z., & Cengiz, C. (2013). Determination and association of physical activity levels and healthy lifestyle behaviors of folk players. *International Journal of Sport Culture and Science, 1*(3), 24-38.

Özkan, S., & Yılmaz, E. (2008). Healthy lifestyle behaviors of nurses working in hospitals. *Fırat Journal of Health Services, 3*(7), 89-105.

Öztürk, M. (2005). *Üniversitede eğitim-öğretim gören öğrencilerde uluslararası fiziksel aktivite anketinin geçerliliği ve güvenirliği ve fiziksel aktivite düzeylerinin belirlenmesi.* Yüksek Lisans Tezi. Hacettepe Üniversitesi, Sağlık Bilimleri Enstitüsü, Ankara.

Özüdoğru, E. (2013). Ü*niversite personelinin fiziksel aktivite düzeyi ile yaşam kalitesi arasındaki ilişkinin incelenmesi,* Doctoral Dissertation, Mehmet Akif Ersoy Üniversitesi Eğitim Bilimleri Enstitüsü.

Pasinlioğlu, T., & Gozum, S. (1998). Health behaviours of health staff working in the primary health services. *Cumhuriyet Universitesi Hemsirelik Yüksekokulu Dergisi, 2*(2), 60-68.

Polat, Ü., & Kahraman, B.B. (2013). The relationship between living space and perceived social support in the situation to be lived. *Fırat Medical Journal,18*(4), 213-218.

Raustorp, A., Pangrazi, R. P., & Ståhle, A. (2004). Physical activity level and body mass index among schoolchildren in south-eastern sweden. *Acta Paediatrica, 93*(3), 400-404.

Savcı, S., Öztürk, M., Arıkan, H., İnal İnce, D., & Tokgözoğlu, L. (2006). Physical activity levels of university students. *Archives of the Turkish Society of Cardiology, 34*(3), 166-172.

Sayan A, Erci B (2001). Çalışan kadınların sağlığı geliştirici tutum ve davranışları ile öz-bakım gücü arasındaki ilişkinin değerlendirilmesi. *Atatürk Üniversitesi Hemşirelik Yüksekokulu Dergisi, 4*(2),11-19.

Söyleyici, Z.S. (2018). *Üniversite öğrencilerinde sağlıklı yaşam biçimi davranışlarının fiziksel aktivite düzeylerine göre irdelenmesi*, Gazi Üniversitesi Sağlık Bilimleri Enstitüsü, Beden Eğitimi ve Spor Anabilim Dalı, Doktora Tezi.

Şimşek, E. (2020). *Halk oyunu oynayan ve oynamayan lise öğrencilerinin günlük fiziksel aktivite davranış düzeyi ve sağlıklı yaşam biçimi davranışı ile ilişkili faktörler,* Master's Thesis, Aydın Adnan Menderes Üniversitesi, Sağlık Bilimleri Enstitüsü.

Tambağ, H. (2010). *Huzurevindeki yaşlılara sağlıklı yaşam biçimi ve yaşam doyumu geliştirmeye yönelik verilen psiko eğitimin değerlendirilmesi.* Hemşirelik Programı, Doktora Tezi, Hacettepe Üniversitesi Sağlık Bilimleri Enstitüsü. Ankara, Türkiye.

Tammelin, T., Näyhä, S., Laitinen, J., Rintamäki, H., & Järvelin, M. R. (2003). Physical activity and social status in adolescence as predictors of physical inactivity in adulthood. *Preventive Medicine, 37*(4), 375-381. https://doi.org/10.1016/s0091-7435(03)00162-2

Thanavaro, J. L., Moore, S. M., Anthony, M., Narsavage, G., & Delicath, T. (2006). Predictors of health promotion behavior in women without prior history of coronary heart disease. *Applied Nursing Research, 19*(3), 149-155. https://doi.org/10.1016/j.apnr.2005.07.006

Türkmen, M., Kul, M., Ocalan, M., Ozkan, A., & Bozkus, T. (2013). Determination of the relationship between physical activity levels and healthy lifestyle behaviors of university students. *Australian Journal of Basic and Applied Sciences, 7*(10), 507-512.

Vural, P. I., & Bakir, N. (2015). Healthy lifestyle behaviors of vocational school students and affecting factors. *Acıbadem University Journal of Health Sciences, 1*, 36-42.

Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The health-promoting lifestyle profile: development and psychometric characteristics. *Nursing Research, 36*(2), 76-81.

Yanık, A., & Noğay, N. H. (2017). Sağlık çalışanlarında sağlıklı yaşam biçimi davranışlarının değerlendirilmesi. *Fırat Tıp Dergisi, 22*(4), 167-176.

Yuvakgil, Z. (2017). *Yaşlılarda algılanan sosyal destek düzeyleri, sosyal ağ büyüklükleri ile sağlıklı yaşam biçimi davranışları arasındaki ilişki ve etkileyen faktörlerin belirlenmesi,* Master's Thesis.

Yücel, E. B. (2019). Fiziksel aktivitenin yeme davranışı ve iştah üzerine etkisi. *Başkent Üniversitesi Sağlık Bilimleri Fakültesi Dergisi, 4*(1), 18-32.

Zincir, H., Ege, E., Aylaz, R., Bilgin, N., & Timur, S. (2003). Çalışan ve çalışmayan kadınların sağlıklı yaşam biçimi davranışlarının incelenmesi. *Toplum ve Sosyal Hizmet Dergisi, 14*(1), 77-84.

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Relationship between Physical Activity Habits, Aggressive Behaviour and Cyberbullying among Young Adult University Students*

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Abstract

This study examined the relationship between physical activity habits, aggression, and cyberbullying behaviours among young adult university students. The study was conducted using a convenience sample, and the reliability of the scales was found to be acceptable (α=0.792, α=0.783). The study group consisted of 526 young adult university students who participated in all types of variable-rate (activity duration) and variable-interval (non-periodic) physical activity. While the majority of participants were in the normal BMI range, those who were mildly obese and obese constituted a significant proportion. The predominant motivations for engaging in physical activity were health and fitness, suggesting that these motivations should be considered when designing physical activity programmes. The study revealed no statistically significant difference between gender and participation in physical activity on aggression and cyberbullying, consistent with recent evidence that digital anonymity reduces gender-based aggression patterns. Furthermore, older participants (25-30 years) exhibited marginally higher levels of aggression (M=2.78) compared to their younger peers (M=2.73; p=0.022). The correlation between aggression and cyberbullying was found to be weak (r=.063, p<0.05), and the regression model was non-significant (R^2=.004, R^2_{Adj}=.002), thus emphasising the multifactorial nature of cyberbullying, which may be attributed to factors such as moral detachment and online anonymity. These findings provide a compelling argument for the implementation of interventions aimed at cultivating digital empathy and the provision of structured physical programmes. Additionally, the necessity for intersectional research to unravel the intricate interplay of cultural and contextual influences on online aggression is underscored.
Keywords: Aggression behaviour, Cyberbullying, Physical activity habits, University students, Young adults

Genç Yetişkin Üniversite Öğrencilerinde Fiziksel Aktivite Alışkanlıkları, Saldırgan Davranışlar ve Siber Zorbalık Arasındaki İlişki

Öz

Bu çalışma, genç yetişkin üniversite öğrencileri arasında fiziksel aktivite alışkanlıkları, saldırganlık ile siber zorbalık davranışları arasındaki ilişkiyi incelemektedir. Araştırma kolayda örnekleme yöntemi ile gerçekleştirilmiştir. Ölçeklerin güvenilirliği (α=0.792, α=0.783) kabul edilebilir düzeydedir. Çalışma grubu değişken oranlı (etkinlik süresi) ve değişken aralıklı (periyodik olmayan) fiziksel aktivitenin tüm türlerine katılan 526 genç yetişkin üniversite öğrencisidir. Katılımcıların büyük çoğunluğu normal BKİ aralığında olmakla birlikte, hafif şişman ve şişman bireyler de önemli bir oran oluşturmaktadır. Fiziksel aktivitelere katılma amaçları arasında sağlık ve fit olmak ön plandadır, bu da fiziksel aktivite programlarının tasarlanmasında bu motivasyonların dikkate alınması gerektiğini göstermektedir. Sonuçlar cinsiyet ve fiziksel aktiviteye katılımın saldırganlık ve siber zorbalık üzerinde istatistiksel olarak anlamlı bir fark olmadığını ortaya koymuş ve dijital anonimliğin cinsiyete dayalı saldırganlık kalıplarını azalttığına dair son kanıtlarla uyum sağlamıştır. Yaşlı katılımcılar (25-30 yaş) genç akranlarına (M=2.73; p=0.022) kıyasla marjinal olarak daha yüksek saldırganlık (M=2.78) sergilemiştir. Saldırganlık ve siber zorbalık arasındaki zayıf korelasyon (r=.063 p<0.05) ve anlamlı olmayan regresyon modeli (R^2=.004, R^2_{Adj}=.002), siber zorbalığın ahlaki kopukluk ve çevrimiçi anonimlik gibi çok faktörlü köklerini vurgulamıştır. Bu bulgular, dijital empatiyi ve yapılandırılmış fiziksel programları hedefleyen müdahalelerin yanı sıra çevrimiçi saldırganlık üzerindeki kültürel ve bağlamsal etkileri ayrıştırmak için kesişimsel araştırmaları savunmaktadır.
Anahtar kelimeler: Saldırgan davranış, Siber zorbalık, Fiziksel aktivite alışkanlıkları, Üniversite öğrencileri, Genç yetişkinler

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INTRODUCTION

In social science definitions, the problem arises of extending or restricting concepts according to the content of abstract concepts. For this reason, when defining the concept of aggression, it would be useful to use the definition of "any behaviour designed to harm, cause pain or injury to another human being", which is known and accepted by most scientists. Based on this definition, aggression is defined as "hurtful and disturbing behaviour towards another living being or object in general" (Boxer & Tisak, 2005). Aggression has been conceptualised as the response of an individual to a situation of inhibition, humiliation, or perceived threat associated with emotions such as anger and hostility (Morgan & Arıcı, 1981). Among the factors that influence aggression, there are many such as easy access to violent means, liking violent behaviour, friends and mass media.

The relationship between aggressive behaviour and physical activity (PA) is complex and bidirectional, and is shaped by moderating variables such as exercise type, intensity, and individual psychosocial factors. Recent meta-analyses suggest that moderate PA, particularly aerobic exercise, is associated with reduced aggression through improved emotional regulation and attenuated neurobiological stress responses (Nesin et al., 2025). For example, Lubans et al. (2016) synthesized 28 studies and found that regular PA (≥150 min/week) was associated with a 15–20% reduction in aggressive tendencies. Similarly, deDiosBenítez-Sillero (2023) showed that yoga and mindfulness-based PA reduced hostility in adolescents. Conversely, high-intensity or competitive PA may increase aggression, particularly in individuals with predisposing characteristics. LuisUbago-Jiménez et al. (2021) found that contact sports (e.g., boxing, rugby) were associated with transient increases in aggressive affect due to increased arousal and social comparison mechanisms. Longitudinal data also suggest that athletes in competitive environments exhibit increased baseline aggression over time, suggesting chronic stress or normalization of aggressive behaviour (Zhu et al., 2022). Meta-regression analyses suggest that the anti-aggression effects of PA are stronger in youth and clinical populations (e.g., individuals with ADHD or anxiety disorders), whereas the benefits are diminished in adults without baseline aggression (Wilson et al., 2020). Similar differences have been identified across gender. Males in team sports report higher aggression related to peer dynamics, whereas females exhibit greater emotional regulation than non-competitive PA (Benítez-Sillero et al., 2021). Considering these findings, PA generally serves as a protective factor against aggression.

With the development of technology, mass media play a significant role in the transfer of aggression to virtual environments. This situation has resulted in an increase in verbal aggression. The ease of access to the internet, the widespread use of sophisticated mobile phones and the development of social networks have led to an increase in virtual behaviour. Social media has become a platform on which appeals to all age groups, changing and growing rapidly every day (Tabuk & Karadağ, 2022). Social and verbal bullying, which are traditional forms of bullying,

have moved into cyberspace as face-to-face communication has moved into virtual environments (Leung et al., 2018).

Cyberbullying has a more complex structure than traditional types of bullying. The reasons for this complexity include factors such as the fact that the methods of cyberbullying (mobile phone, internet, social media, etc.) are different from traditional bullying (Hinduja & Patchin, 2008), the content shared in the cyber environment is permanent (Slonje et al., 2013; Wilson et al., 2020), and bullies can remain anonymous (Becerra, 2017). Therefore, despite its recent emergence, cyberbullying is recognised as an important issue due to its serious consequences such as low self-esteem, hopelessness, depression and anxiety (Alleva, 2019). Cyberbullying is defined as "repetitive and hurtful behaviour by an individual or group using technological tools to intentionally harm others" (Haber & Haber, 2007). Similarly, cyberbullying is also described as "aggression perpetrated over time and repeatedly by an individual or group using electronic communication tools against a victim who has difficulty defending himself or herself" (Smith et al., 2008).

Cyberbullying behaviour, which is widespread in society, has negative consequences for both the bully and the victim. Serious and severe consequences such as sadness, stress, depression (Kraft & Wang, 2010; Hemphill et al., 2015), loneliness (Willard, 2007), feelings of worthlessness (Hinduja & Patchin, 2010; Yaman et al., 2011) and even suicidal tendencies (Henson, 2012) are observed in cyberbullying victims. Cyberbullying is a form of aggression, based on the definitions that people who bully in the virtual environment have an aggressive attitude. The most important point is that the attackers can hide their identity through the anonymity provided by social networks. Behaviour involving threats, blackmail, or psychological violence is an act defined by law and has legal consequences (Bostancı-Bozbayındır, 2019; Bossler & Berenblum, 2019). For instance, cyberbullying, which includes online threats and coercive tactics, is criminalized under cybercrime laws in jurisdictions such as the European Union and the United States (Bostancı-Bozbayındır, 2019). Messages, comments, statements, and similar expressions shared on social networks may contain bullying content, and such digital interactions are increasingly recognized as admissible evidence in legal proceedings (AyofeAzeez et al., 2021). Psychological violence, such as sustained harassment or defamation on platforms like Instagram or X (formerly Twitter), has led to civil lawsuits and criminal charges, reflecting evolving legal frameworks to address digital harm (Bossler & Berenblum, 2019). This situation shows that cyberbullying can have serious negative effects at both individual and societal levels. Defining the aggression levels and dimensions of individuals who engage in such behaviours is an important aspect of research. The fact that aggressive behaviour can lead to clinical consequences such as suicide or homicide is similar to the consequences experienced by individuals exposed to cyberbullying (Hinduja & Patchin, 2018). For example, offline aggressive behaviours, including physical violence and verbal threats, have been linked to increased risks of suicidal ideation and completed suicides (Gámez-Guadix et al., 2013), as well as homicide perpetration (Bender et al., 2018). These outcomes mirror the severe psychological harm caused by cyberbullying, which studies associate with elevated rates

of depression, self-harm, and suicidal behaviours among victims (Henson, 2012; Volk et al., 2022). Research further demonstrates that both traditional aggression and cyberbullying disrupt neurobiological stress responses, exacerbating long-term mental health crises (Erbiçer et al., 2023). Therefore, the social lives of both aggressive and bullying individuals and victims are negatively affected.

Sport is one of the most important phenomena contributing to the development of universal values such as love, peace and friendship for the individual and society. Sport has many benefits for individuals and society. In its definition of sport, the Council of Europe (2001) emphasised that physical activity includes all activities undertaken for physical or personal health, social or competitive purposes (Parks et al., 2003). Pitts et al. (1994) defined sport as all activities, experiences and occupations primarily related to fitness, recreation, competition and leisure. As can be seen from these definitions, social activities like gymnastics, games and sports appear as a form of physical activity. These activities are supported by intrinsic and extrinsic sources of motivation according to the benefits they provide to the participant. For example, the increase in serotonin and dopamine levels in people who are physically active can make them feel more peaceful and happier (Lin & Kuo, 2013). The hormonal changes that occur in the body may help the individual to be more active and social (Hill et al., 2008).

Physical activity (PA) habits are fundamental to human behaviour and social life, exerting dual effects on individual well-being and social functioning. Systematic reviews show that consistent PA participation (≥150 minutes per week) improves cognitive and emotional regulation, reduces impulsivity, and promotes social behaviours such as cooperation and empathy (Lubans et al., 2016). Neurobiological studies have implicated PA in moderating decision-making and social cognition, thereby improving conflict resolution skills in group settings (Tran et al., 2021). Furthermore, PA habits are strongly associated with mental health resilience, with a 30% reduction in depression and anxiety rates found in physically active individuals (Bermejo-Cantarero et al., 2021). Socially, PA habits serve as a conduit for community bonding and cultural adaptation. Group-based activities, such as team sports or community exercise programs, strengthen social capital by promoting trust and shared identity, especially in diverse populations (Benítez-Sillero et al., 2021). For example, adolescents who participate in school sports exhibit higher peer acceptance and lower social isolation, buffering against cyberbullying and digital alienation. Conversely, sedentary lifestyles are associated with social withdrawal and reduced civic engagement, exacerbating social fragmentation (Wilson et al., 2020). Cultural norms also shape PA participation; collectivist societies prioritize social activities, while individualist cultures emphasize personal fitness, which yields different behavioural outcomes (Hofstede, 2013).

Due to the numerous positive effects of physical activities, the positive effects on the physical and mental health of individuals (Tabuk, 2023) who socialize by participating in physical activities can lead to an increase in their general quality of life and a decrease in aggressive behaviour. It is predicted that individuals with healthy bodies and minds will reduce or eliminate cyberbullying

behaviours. It is thought that individuals who become healthier through exercise will move away from aggression and bullying behaviour. Thus, it is important that the notion, causes, dimensions and relationship of aggression and cyberbullying with sport are explored.

In this context, the problem statements of the research were created as follows:
1. Is aggressive behaviour effective against cyberbullying??
2. Is participation in physical activity effective on aggressive behaviour?
3. Is participation in physical activity effective for cyberbullying?

METHOD

Research model

The relational research model has been used, which is particularly effective in the determination of the existence, direction and strength of associations between two or more variables (Creswell & Creswell, 2018; Cohen et al., 2018). According to Bryman (2016), this model allows researchers to explore correlations without implying causation, making it suitable for studies aiming to identify patterns or trends within a specific population. Additionally, Saunders et al. (2019) emphasise that relational studies are valuable for generating hypotheses and providing a foundation for further experimental research. By employing this model, the current study seeks to uncover meaningful connections between physical activity participation and other relevant factors among university students.

Sampling Group

The study population comprises university students engaged in various forms of physical activity. In this regard, over 400 university students participating in physical activities with variable rates (activity duration) and intervals (non-periodic) will be included in the research. The types of physical activities are categorised as follows: Sports: "*aerobics, dance, yoga, fitness, tennis, swimming, table tennis, billiards, cycling, astroturf, football, basketball, folk dancing, hiking etc.*"; Daily activities: *"housework, carrying light loads, vineyard and garden work, walking, etc."*.

The study group will consist of university students who are not active licensed athletes. The convenience sampling method, known for its simplicity, efficiency, and cost-effectiveness in data collection from the target population, was employed in this study (Etikan et al., 2016; Taherdoost, 2016). Determining the sample size is crucial in social science research. Yazıcıoğlu and Erdoğan (2014) stated that 370 samples would be sufficient for a population of 25,000 (±0.05, p=0.05). The student population at Hitit University (18,373), the analyses in this study were performed using 526 data points.

Table 1. Demographic data about the participants

N=526	Variables	Frequency	Percentage
Gender	Female	104	19,8
	Male	422	80,2
Age	18-24 age	433	82,3
	25-30 age	93	17,7
Body Mass Index	Underweight	142	27,0
	Normal range	238	45,2
	Overweight	106	20,2
	Obese	40	7,7
Purpose of participating in physical activities	Health (Physical-Spiritual)	193	36,7
	Getting Fit	189	35,9
	Socialisation and gaining status	55	10,5
	Leisure time utilisation	89	16,9

The participants were 80.2% male and 19.8% female. This distribution indicates that men make up the majority of the sample group. This may indicate that the study focuses on a topic more common among men, or that men are more likely to get involved in exercising compared to women. It was found that 82.3% of those surveyed were aged between 18-24 and 17.7% were aged 25-30. This distribution shows that the sample group consists mainly of young adults. This situation suggests that the study was particularly focused on young adults. While 42.1% of the participants said they were physically active, 57.9% of them were sedentary. This distribution shows that the study was conducted on heterogeneous individuals. Obesity is commonly measured using Body Mass Index (BMI) (weight/height², kg/m²), with BMI ≥30 indicating obesity. Although BMI is widely used for population screening, it does not assess fat distribution or distinguish between fat and muscle mass. Additional measures such as waist circumference or waist-to-hip ratio assess central adiposity, which is associated with health risks. Advanced methods (e.g. DEXA, BIA) provide accurate body fat percentages but are less accessible. This study used the classic obesity formula (body mass index (BMI) = weight/height²). Among the participants, 27.0% were classified as underweight, 45.2% as normal weight, 20.2% as slightly overweight, and 7.7% as obese. This distribution shows that the majority of participants are in the normal BMI (*Body Mass Index*) range. However, the total proportion of people in the mildly obese and obese categories is 27.9%. This rate represents a significant proportion of overweight and obese individuals in the sample group. BMI distribution is an important for analysing the relationship between physical activity habits and health status. While 36.7% of the participants participate in physical activity for health reasons (physical and mental), 35.9% of them participate in physical activity to get fit. Socialising and status (10.5%) and leisure (16.9%) are less important. These results show that people participate in physical activity mainly to improve their health and physical appearance.

Data collection tools

A "personal information form" was developed. This form includes details such as gender, age, education, income and participation in physical activity. The physical activity scales used in the literature were analysed in this direction; to determine the frequency of physical activity with a 5-choice statement prepared by the researcher for the purpose (how many times per month times '1-5 and more') frequency of activity; physical activity in social form a 4-choice statement prepared to determine the purpose of participating in activities (physical and mental health-being fit-socialising-gaining status-recreational reasons). An attempt was also made to determine the participant's goal.

Aggression Scale: In order to measure the aggression level of the participants, the 29-item 4-dimensional aggression scale developed by Buss and Perry (1992) (α=0.89) and the Turkish validity and reliability study conducted by Demirtaş-Madran (2012) (α=0.97) were used. The reliability value that was obtained for this study was (α=0.79). Items 9 (*I am a moderate person*) and 16 (I cannot think of a good reason to hit someone) were reverse coded. The scale is a 5-point Likert scale and is scored as "*1= not very true to my character and 5= very true to my character*". The dimensions of the scale are Physical Aggression: 9 items, Verbal Aggression: 5 items, Hostility: 7 items and Anger: 7 items. Some of the statements in the scale are as follows *"I break things when I get very angry". "When people disagree with me, I cannot stop arguing with them". "I wonder why I am so cruel about some things". "I show my anger when I am very angry"*.

Cyberbullying scale: In order to determine the cyberbullying level of the participants, the 6-item unidimensional cyberbullying scale developed by Lam and Li (2013) (α=0.96), whose Turkish validity and reliability study was conducted by Gençdoğan and Çikrıkci (2015) (α=0.95), was used. The reliability value determined for this study was (α=0.80). The scale is a 5-point Likert scale with 0='never' and 4='4 times or more'. Statistically, '1' was used instead of the numerical value '0' and the mean and standard deviation values obtained as a result of the analyses were reduced by "-1" point and realised to ensure the original scoring of the scale. High scores on the scale indicate high levels of cyberbullying. Some of the statements in the scale are as follows; *"How often have you bothered others with text messages and emails?". "How many times have you insulted others through text messages and e-mails?". "How many times have you said immoral things to others via text messages or e-mails?".*

Ethical Approval

The ethics committee approval required to conduct the research was obtained from "*Hitit University Non-Interventional Clinical Research Ethics Committee*" on 06.05.2024 with decision number 2024-165.

Data Collection

The participants were briefed on the instructions and purpose of the questionnaire. It was verified that the participants were university students and the questionnaire was administered face-to-face with volunteer students. The study, which took into account university students' exam periods, was carried out between April and July 2024.

Data Analysis

Consistent with the purpose of the study, the reliability analysis of the measures used during the first phase showed that the Cronbach's Alpha reliability values of the measures exceeded 0.70. The data set was found to have a normal distribution according to the skewness and kurtosis values performed to determine the level of normality. Following these analyses, the independent samples t-test was used to test the relationships between the demographic variables, and correlation and regression tests were used to examine the relationships between the variables and test the hypotheses. All data analysis was by means of SPSS.

RESULTS

The results of the analyses carried out on the data obtained through the questionnaire form used in the research, according to the responses of the participants, are as follows.

Table 2. Aggression level scale descriptive statistical data

	α= 0.792 M= 2.74 SD=0.42 N=526	**M**	**S**	**Strongly disagree**	**Disagree**	**Undecided**	**Agree**	**Strongly Agree**	**Skewness**	**Kurtosis**
1	*Some of my friends think I am impulsive.*	2,76	1,15	74	176	106	140	30	,14	-1,02
2	*If you had to resort to violence to protect your rights, would you do it?*	2,56	1,07	83	209	101	121	12	,28	-,93
3	*Whenever people act nice to me, I wonder what they want.*	2,47	1,10	105	194	126	77	24	,47	-,52
4	*When I disagree with my friends, I tell them openly.*	4,14	,86	7	24	53	247	195	-1,18	1,42
5	*When I get extremely angry, I break things.*	2,38	1,17	133	203	75	88	27	,61	-,63
6	*When people disagree with me, I can't help arguing with them.*	2,25	,96	107	263	82	66	8	,72	-,02
7	*I wonder why I am so harsh about certain topics.*	2,43	1,14	116	209	85	93	23	,53	-,66
8	*Sometimes I can't control the urge to hit others.*	1,66	,80	259	211	33	20	3	1,38	1,17
9	*I am an even-tempered person.*	4,09	,83	8	19	57	274	168	-1,17	1,03
10	*I am very friendly but skeptical of strangers.*	3,95	,95	12	40	60	266	148	1,01	1,01
11	*I have threatened people I know.*	1,27	,44	143	126	144	60	53	,43	-,80
12	*I get angry quickly (flare up) but calm down immediately.*	3,28	1,18	45	105	104	200	72	-,84	-,84

Table 2 (Continue). Aggression level scale descriptive statistical data

	α= 0.792 M= 2.74 SD=0.42 N=526	M	S	Strongly disagree	Disagree	Undecided	Agree	Strongly Agree	Skewness	Kurtosis
13	*If provoked, I could hit someone.*	2,10	1,08	180	202	73	53	18	,10	,10
14	*If someone angers me, I can tell them what I think about them to their face.*	3,35	1,20	50	89	93	213	81	-,75	-,75
15	*Sometimes I torment myself with jealousy.*	2,52	1,20	115	188	88	103	32	-,86	-,86
16	*I can't think of a good reason to hit someone.*	3,40	1,26	48	92	106	159	121	-,38	-,93
17	*Sometimes I feel like life treats me unfairly.*	3,17	1,18	44	139	88	193	62	-1,05	-1,05
18	*I struggle to control my anger.*	2,19	1,08	158	209	72	76	11	-,41	-,41
19	*When I'm very angry, I show my rage.*	3,30	1,18	40	119	82	212	73	-,93	-,93
20	*Sometimes I feel like people are laughing behind my back.*	2,81	1,25	89	160	82	150	45	-1,18	-1,18
21	*I often find myself opposing others.*	2,12	1,00	155	223	90	46	12	,20	,20
22	*If someone hits me, I hit them back.*	3,31	1,18	47	93	115	194	77	-,76	-,76
23	*Sometimes I feel like a ticking time bomb.*	2,89	1,26	76	163	90	138	59	-1,14	-1,14
24	*Some people provoke me so much that we end up in a fistfight.*	1,84	,92	216	229	43	27	11	1,86	1,86
25	*I know friends who talk behind my back.*	3,32	1,18	41	110	95	201	79	-,88	-,88
26	*My friends say I'm argumentative.*	1,95	,97	195	223	58	41	9	,72	,72
27	*Sometimes I suddenly get angry for no reason.*	2,21	1,07	141	233	72	60	20	,06	,06
28	*I get into fights abit more quickly than the average person.*	1,90	,939	198	239	45	34	10	1,41	1,41

The internal consistency coefficient of the aggression scale was calculated to be .792. This value indicates that the scale is reliable and that the items consistently measure the tendency to be aggressive. These values, which exceed the limit of 0.70 required for the internal consistency coefficient to be considered reliable, indicate that the scales are valid and reliable. The table shows that the skewness and kurtosis values of the statements meet the normality assumption. The results of the skewness and kurtosis analyses performed to determine the level of normality of the data set were found to be between ±2 and the data set was found to be normally distributed (George & Mallery, 2019). The results indicate that the data obtained are reliable for analysis.

The sum of the scale M=2.74 and S=0.42. This shows that the aggression tendencies of the participants are generally at a moderate level. When analysing the mean scores of the scale statements, it can be seen that some statements have high mean scores. Most participants agreed or strongly agreed with the statement "*When I disagree with my friends, I tell them openly* (M=4.14, S=.86)". This shows that the participants are open and honest. The majority of respondents agreed with the following statement "*I am a moderate person* (M=4.09, S=.83)". This shows that the participants generally perceive themselves as calm and moderate. However, some statements have a low mean. The majority of the participants disagreed or strongly disagreed with the statement *"Sometimes I cannot control the urge to hit others* (M=1.66, S=.80)". This shows

that the participants' propensity to violence is low. Similarly, most participants disagreed with the statement *"I have threatened people I know* (M=1.17, S=.44)". This shows that the participants' tendency to threaten is very low.

Table 3. Descriptive statistics of cyberbullying level scale

	α= 0.783 Mean= 1.37 SD= 0.89 N=526	M	S	Never	1 time	2 times	3 times	4 times	Skewness	Kurtosis
1	*How often have you disturbed others through social networks, text messages, or email?*	0,67	0,09	324	126	21	31	24	1,46	1,26
2	*How often have you called others a bad name through social networks, text messages, or email?*	0,97	0,14	235	153	78	34	26	1,10	,43
3	*How often have you said immoral things to others through social networks, text messages, or email?*	1,46	0,41	215	44	123	93	51	,33	-1,28
4	*How often have you told others that you would hurt or beat them through social networks, text messages, or email?*	1,67	0,48	183	72	82	113	76	,20	-1,43
5	*How often have you threatened others through social networks, text messages, or email?*	1,69	0,56	180	95	67	112	72	,30	-1,45
6	*How often have you made up things to make someone disliked by others through social networks, text messages, or email?*	1,48	0,49	196	115	62	68	85	,53	-1,18

The internal consistency coefficient of the cyberbullying scale was calculated to be 0.783. The sum of the scale M=1.37 and S=.890. This shows that the participants' cyberbullying tendencies are generally at a low level. The table shows that the skewness and kurtosis values (±2) of the statements meet the normality assumption. The results show that the scale is valid (±2) and reliable (>0.70).

The majority of the participants (324 student) responded to the question "*How many times have you disturbed others through social networks, text messages or emails* (M=.67, S=.09)" by saying that they never disturbed others. This shows that participants hardly ever engage in such behaviour. When asked "*How many times have you defamed others using social networks, text messages and emails* (M=.97, S=.14)", the majority of participants (235 student) said that they've never done this. However, the number of those who had done this once (n=153) or twice (n=78) is also noteworthy. Although a significant proportion of participants (183 student) said they had never done this, the number of those who had done it three or more times (113 + 76 = 189 student) is quite high for the statement "*How many times have you told others via social networks, text messages and emails that you would hurt or hit them* (M=1.67, S=.48)". Similarly, to the statement "*How many times have you threatened others via social networks, text messages and emails* (M=1.69, S=.56)", although a significant proportion of participants (180 student) stated that they had never threatened others, the number of those who had threatened others 3 times or more (112 + 72 = 184 student) is quite high.

Table 4. Results of t-tests related to the scales

	Gender	**N**	**M**	**S**	**t**	**df**	**p**
Aggression	Women	104	2,72	,46	-,614	524	,488
	Men	422	2,75	,41	-,579	147,682	
Cyberbullying	Women	104	1,28	,90	-1,251	524	,225
	Men	422	1,39	,89	-1,232	154,731	
	Age	**N**	**M**	**S**	**t**	**df**	**p**
Aggression	18-24 ages	433	2,73	,43	-,952	524	,022*
	25-30 ages	93	2,78	,38	-1,038	148,530	
Cyberbullying	18-24 ages	433	1,37	,90	,251	524	,690
	25-30 ages	93	1,35	,87	,255	136,813	
	Attending physical activities	**N**	**M**	**S**	**t**	**df**	**p**
Aggression	Yes	155	2,77	,44	,845	524	,538
	No	371	2,73	,41	,825	274,364	
Cyberbullying	Yes	155	1,43	,89	,824	524	,831
	No	371	1,34	,90	,819	284,812	

p<0,05

Table 4 analyses the differences between the groups according to gender, age and participation in physical activity. In the analyses, no statistically significant difference was found between the genders in terms of aggression and cyberbullying scores (p>0.05). According to the results the difference between the aggression scores of females (M=2.72) and males (M=2.75) was not significant (t=-.614; p=.488). Similarly, when comparing the cyberbullying scores, the difference between the females (M=1.28) and males (M=1.39) was not statistically significant (t=-1.251; p=.225). The results show that there is no significant relationship between aggression and cyberbullying levels based on gender.

The mean aggression score of the 18-24 age group was M=2.73 and the mean aggression score of the 25-30 age group was M=2.78 (t = -.952, p = .022). There is a statistically significant difference in aggression scores between the age groups (p<0.05). The aggression score of the 25-30 age group is higher than that of the 18-24 age group. According to the mean cyberbullying scores, the mean score of the 18-24 age group was M=1.37 and the mean score of the 25-30 age group was M=1.35 (t = .251, p= .690). There is no statistically significant difference between the age groups of cyberbullying scores (p<0.05).

As a result of the analyses, no statistically significant difference was found between physical activity participation and aggression and cyberbullying levels of individuals (p>0.05). The findings indicated that aggression did not make a significant difference between those who participated in exercise (M=2.77) and those who did not (M=2.73) (t=.845, p= .538). Similarly, no statistically significant difference was observed between individuals who participated in Similarly, cyberbullying did not make a significant difference between those who participated in physical activity (M=1.43) and those who did not (M=1.34) (t=.824, p= .831). The findings revealed that

the difference between the groups did not meet the level of statistical significance for both variables.

Table 5. The correlation relationship between cyberbullying and aggression

	M	S	Aggression	Cyberbullying
Aggression	2,74	,42	1	
Cyberbullying	1,37	,90	,146	1

p<0,05

The results presented in the table show that there is a statistically significant but rather weak positive relationship between cyberbullying and the aggression variables. Analysis of the correlation coefficient ($r = 0.146$, $p < 0.05$) suggests that higher levels of cyberbullying behaviour are marginally associated with increased reports of aggression rated as exceeding normative thresholds. However, although the minimum magnitude of the correlation ($r = 0.146$) was statistically significant at the 0.05 alpha level, this relationship appears to be limited. This suggests that cyberbullying explains only a small proportion of the variance in aggressive behaviour and that this relationship is not significant in practice. The findings highlight the need to interpret effect size as well as statistical significance in order to contextualize the important implications of such relationships, particularly in research examining multifaceted psychosocial phenomena such as aggression.

Table 6. Regression analysis of aggression predicting cyberbullying

Variable	B	t	p	R	R^2	R^2_{Adj}	F	p
Constant	2,787	82,138	,000					
Cyberbullying	-,030	-1,456	,146	,063	,004	,002	2,121	,146

p<0,05

The results of the regression analysis show a non-significant negative relationship between aggression and cyberbullying, as indicated by the regression coefficient ($B = -0.030$, $t = -1.456$, $p = .146$). The negligible magnitude of the coefficient ($B = -0.030$), coupled with the insignificant p-value, which exceeds the conventional alpha threshold of 0.05, indicates that aggression does not have a statistically significant predictive capacity for cyberbullying in the model analysed. Furthermore, the overall explanatory power of the model is critically limited, as indicated by the correlation coefficient ($R = .063$) and the coefficient of determination ($R^2 = .004$, $R^2_{Adj} = .002$). These values indicate that the model explains only 0.4% of the variance in cyberbullying, and the adjusted R^2 implies that there is no significant predictive benefit after accounting for model complexity. Consequently, the null hypothesis that aggression does not significantly predict cyberbullying cannot be rejected on the basis of these results. The results show that aggression, as operationalised in this analysis, lacks empirical relevance as a predictor of cyberbullying behaviour and highlight the need to explore alternative predictors or contextual mediators in order to better elucidate the mechanisms underlying the phenomenon of cyberbullying.

DISCUSSION AND CONCLUSION

The present study set out to examine the relationships between aggressive behaviours, physical activity and cyberbullying. The findings obtained provide important implications for the dynamics of these variables, especially in the young adult population. When the results of the study are evaluated in the context of the hypotheses, they are found to be in parallel with some of the findings in the literature and to differ in some points.

Relationships with Demographic Variables

The findings show that the vast majority of participants were in the normal BMI range but also included a significant proportion of slightly overweight and obese individuals. Health and fitness were the most important reasons for participating in physical activity. The results indicate health and appearance motivations should be considered when designing physical activity programmes (Lubans et al., 2016). The health benefits of physical activity play an important role in the prevention of obesity and chronic disease (Warburton et al., 2006).

The absence of a substantial impact of gender on aggression or cyberbullying ($p > 0.05$) has given rise to a renewed examination of gender-based variations in the existing literature. For instance, while Western studies have previously indicated that males tend to exhibit higher levels of aggression (Kraft & Wang, 2010), this study did not support such a gender disparity. This discrepancy may be attributable to cultural influences. It is possible that gender roles in Turkey socially restrict women's expression of aggression, but that these behaviours can be masked in the digital environment (Arıcak et al., 2012).

The lack of significant gender differences in aggression ($p=.488$) and cyberbullying ($p=.225$) is in line with recent shifts in the literature questioning traditional assumptions about male-dominated aggression. Conventional wisdom, informed by biological and social factors such as testosterone levels and socialisation into dominant roles, has historically attributed higher levels of aggression to males (Archer, 2019). However, contemporary research underscores the pivotal role of digital environments in shaping gendered behaviours. For instance, Hu et al. (2021) observed a narrowing of gender disparities in cyberbullying when online platforms offered anonymity, thereby mitigating societal expectations about femininity and masculinity. This phenomenon, termed 'digital neutrality', has been shown to allow both genders to engage in aggressive behaviour without immediate social repercussions (Suler, 2004). Furthermore, the increase in indirect aggression, such as relational or verbal hostility, in digital spaces may explain why women in this sample reported levels of aggression comparable to men (Volk et al., 2022).

However, the findings of this study indicate statistically significant differences between age groups with respect to both aggression and cyberbullying scores. The 25-30 age group exhibited higher levels of aggression ($M = 2.78$) and cyberbullying ($M = 2.59$) in comparison to the 18-24 age group ($p < 0.05$). The findings suggest that age may be an effective factor in the development of

aggression and cyberbullying behaviours (Hinduja & Patchin, 2010). The development of individuals' emotional regulation skills with increasing age may lead to a decrease in aggression and cyberbullying behaviours (Eisenberg et al., 2010). However, the fact that the 25-30 age group had higher scores in this study suggests that aggression and cyberbullying behaviours may increase with age. This phenomenon may be attributed to various factors, including the heightened socioeconomic stress experienced by older individuals and the increased time spent on digital platforms (Karakuş & Turan, 2022).

Additionally, it is postulated that the level of hope and expectations of university youth preparing for working life is associated with aggression. The slightly higher aggression scores observed among older participants (25-30 years and 18-24 years; p=.022) align with life cycle theories suggesting that emerging adulthood (18-30 years) is characterised by instability and stress. Jensen-Arnett (2023) characterises this period as a 'volatile phase', marked by career uncertainty, financial pressures and evolving social role factors that can intensify feelings of frustration and hostility. For instance, transitioning to full-time employment or extricating oneself from habitual responsibilities may increase stress, which, in turn, can indirectly fuel aggression.

Relationship between Aggressive Behaviours and Cyberbullying

A study of the cyberbullying behaviours of participants reveals that verbal bullying, i.e. the use of offensive expressions and name-calling, occurs at a low level; however, more severe forms of cyberbullying, such as physical attacks and threats of harm, are relatively more prevalent. These findings suggest that cyberbullying might be a significant problem, in particular among young adults (Erbiçer et al., 2023).

The primary research question posed in the study pertains to the relationship between aggressive behaviours and cyberbullying. The findings revealed a statistically significant yet modest positive correlation between aggression and cyberbullying ($r = 0.146$, $p < 0.05$). This observation suggests that aggression may offer a limited explanatory capacity for cyberbullying behaviours. A similar finding was reported in a study, which identified a low-level relationship between cyberbullying and traditional aggression (Watts et al., 2017). However, the regression analysis ($B = -0.030$, $p = .146$) did not significantly predict cyberbullying, suggesting that the practical significance of this relationship is limited. This may be attributed to the multidimensional nature of cyberbullying. The influence of cyberbullying on factors such as anonymity, social skills, and digital literacy (Erbiçer et al., 2023) underscores the complexity of its underlying mechanisms. A meta-analysis conducted in India reported that only 8% of cyberbullying can be explained by traditional aggression (Giumetti et al., 2022), suggesting that aggression alone may not fully capture the complexity of cyberbullying phenomena.

The weak correlation between aggression and cyberbullying ($r=.063$, $p<0.05$) and the no significant regression model ($R^2=.004$, $p=.134$) underscore the multifaceted nature of online aggression. While aggression is often framed as a precursor to cyberbullying, this study suggests

that cyberbullying is driven by distinct mechanisms, such as anonymity, moral disengagement, and social reinforcement (Li et al., 2024). For instance, Barlett (2019) identifies "chronic cyberbullies" who exhibit low empathy and high impulsivity but not necessarily overt aggression. This subgroup may engage in online harm due to the perceived invisibility of consequences, rather than inherent hostility. Furthermore, cultural factors “such as norms valorizing assertiveness” may explain why participants self-reported as "moderate" (M=4.09) yet admitted to verbal aggression (e.g., openly disagreeing with friends, M=4.14). In collectivist societies, direct communication is often framed as honesty rather than hostility, masking underlying aggressive tendencies (Almeida et al., 2022). These findings highlight the need for culturally sensitive frameworks to interpret aggression and cyberbullying, rather than relying on universal metrics.

The overrepresentation of males (80.2%) and young adults (82.3% aged 18–24) limits the generalizability of findings, reflecting broader sampling biases in aggression research. Talwar et al. (2023) note that males are disproportionately recruited in studies on physical aggression, while cyberbullying research often targets adolescents, neglecting emerging adults. This skew may obscure gender or age specific dynamics, such as the role of hormonal fluctuations in female aggression or the impact of parenthood on stress levels. Additionally, the sedentary majority (57.9%) in this sample contrasts with global trends showing rising physical activity among youth, potentially biasing results (Guthold et al., 2018).

As digital interactions become ubiquitous, understanding the drivers of online aggression is paramount. This study underscores that aggression and cyberbullying are not mere extensions of offline behaviour but are shaped by unique digital dynamics. By addressing these complexities through interdisciplinary collaboration-bridging psychology, technology, and education-society can mitigate harm and foster healthier online communities.

The Role of Physical Activity on Aggressive Behaviours and Cyberbullying

The second and third research questions concentrate on the impact of physical activity on aggression and cyberbullying. The study identified no statistically significant correlation between participation in physical activity and either aggression (p=.538) or cyberbullying (p=.089). These findings are consistent with the contentious literature on the role of physical activity in psychosocial outcomes. For instance, while some studies posit that physical activity improves stress and anger management (Biddle & Asare, 2020), a study conducted with university students in Turkey found no significant relationship between physical activity and aggression (Yaşartürk et al., 2022). The study measured general participation in physical activity, without distinguishing between structured (e.g., team sports, yoga) and unstructured (e.g., casual walking) forms. Recent evidence suggests that only mindfulness-based or socially interactive activities (e.g., martial arts, group fitness) significantly reduce aggression by fostering self-control and social bonding (deDiosBenítez-Sillero et al., 2023). In contrast, solitary or non-competitive exercises may lack therapeutic benefits. While these results are consistent with some studies in literature, other studies suggest a significant relationship between aggression and cyberbullying (Li et al., 2024). These

discrepancies may be attributable to variables such as sample characteristics and cultural influences. For instance, in certain cultures, aggressive behaviours may be more readily accepted, while in others, such behaviours may be more strongly disapproved of (Gini & Pozzoli, 2013).

The ineffectiveness of physical activity may be related to the motivations of the participants. For instance, while 36.7% of the participants indicated that they engaged in physical activity for health reasons, the rate of participation for socialisation was comparatively low at 10.5%. This finding suggests that the potential of physical activity to reduce aggression through social interaction may be underutilised. Additionally, the absence of data on qualitative factors, such as the distinction between team sports and individual exercise activities, may have influenced the outcomes (Lubans et al., 2016).

This study reveals a weak relationship between aggression and cyberbullying, emphasising that unidimensional approaches may be insufficient to prevent cyberbullying. The fact that physical activity did not have the expected effect indicates that more comprehensive research is needed in this field. In the Turkish context, the findings suggest that digital literacy training and the implementation of social support mechanisms may be effective in reducing cyberbullying.

The findings of this study suggest that further comprehensive research is necessary to enhance our understanding of cyberbullying and aggression behaviours. In future studies, it is recommended to include factors such as the nature of physical activity (team sports, competitive activities) and psychological well-being variables (stress, self-regulation). Furthermore, the employment of mixed methodologies (quantitative-qualitative) in the form of in-depth examinations of the contextual dynamics of cyberbullying will contribute to a more profound understanding of this phenomenon. In particular, studies in different cultural contexts and with larger samples can help us better understand the causes and consequences of these behaviours.

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REFERENCES

Alleva, N. (2019). *Cyberbullying and gender: A qualitative study of how middle school girls experience cyberbullying* (Doctoral dissertation). Northeastern University.

Almeida, R., Wang, W., & Correia, I. (2022). Cultural values and aggression: A cross-national study. *Journal of Cross-Cultural Psychology, 53*(4), 456-475. https://doi.org/10.1177/00220221221088876

Archer, J. (2019). The reality and evolutionary significance of human psychological sex differences. *Biological Reviews, 94*(4), 1381-1415. https://doi.org/10.1111/brv.12507

Arıcak, O. T., Kınay, H., & Tanrıkulu, T. (2012). First psychometric findings of the cyberbullying scale. *HAYEF Journal of Education, 9*(1), 101–114.

AyofeAzeez, N., O.Idiakose, S., JulietOnyema, C., & VanDerVyver, C. (2021). Cyberbullying detection in social networks: Artificial intelligence approach. *Journal of Cyber Security and Mobility, 10*(4), 745–774. https://doi.org/10.13052/jcsm2245-1439.1046

Barlett, C. P. (2019). *Predicting cyberbullying: Research, theory, and intervention*. Academic Press.

Becerra, D. (2017). *Cyberbullying and attachment theory: Predictors of cyberbullying behaviours in an undergraduate population* (Doctoral dissertation). Pace University.

Bender, P. K., Plante, C., & Gentile, D. A. (2018). The effects of violent media content on aggression. *Current Opinion in Psychology, 19*, 104-108. https://doi.org/10.1016/j.copsyc.2017.04.003

Benítez-Sillero, J. D. D., Armada Crespo, J. M., Ruiz Córdoba, E., & Raya-González, J. (2021). Relationship between amount, type, enjoyment of physical activity and physical education performance with cyberbullying in adolescents. *International Journal of Environmental Research and Public Health, 18*(4), 2038. https://doi.org/10.3390/ijerph18042038

Bermejo-Cantarero, A., Álvarez-Bueno, C., Martínez-Vizcaino, V., Redondo-Tébar, A., Pozuelo-Carrascosa, D. P., & Sánchez-López, M. (2021). Relationship between both cardiorespiratory and muscular fitness and health-related quality of life in children and adolescents: A systematic review and meta-analysis of observational studies. *Health and quality of life outcomes, 19*, 1-15. https://doi.org/10.1186/s12955-021-01766-0

Biddle, S. J., & Asare, M. (2020). Physical activity and mental health in children and adolescents: A review of reviews. *British Journal of Sports Medicine, 45*(11), 886–895. https://doi.org/10.1136/bjsports-2011-090185

Bossler, A. M., & Berenblum, T. (2019). Introduction: New directions in cybercrime research. *Journal of Crime and Justice, 42*(5), 495-499. https://doi.org/10.1080/0735648X.2019.1692426

Bostancı-Bozbayındır, G. (2019). Cyberbullying and criminal law. *Istanbul Law Review, 77*(1), 425–450. https://doi.org/10.26650/mecmua.2019.77.01.0009

Boxer, P., & Tisak, M. S. (2005). Children's beliefs about the continuity of aggression. *Aggressive Behaviour, 31*(2), 172-188. https://doi.org/10.1002/ab.20056

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford University Press.

Tabuk, M. E., &Akbaş, M. (2025). Relationship between physical activity habits, aggressive behaviour and cyberbullying among young adult university students. *Eurasian Journal of Sport Sciences and Education, 7*(1), 96-116.

Buss, A. H., & Perry, M. (1992). The aggression questionnaire. *Journal of personality and social psychology*, *63*(3), 452. https://doi.org/10.1037/0022-3514.63.3.452

Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). Routledge.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.

deDiosBenítez-Sillero, J., Corredor-Corredor, D., ManuelMartínez-Aranda, L., Abellán-Aynés, O., Portela-Pino, I., & Raya-González, J. (2023). Relationship between physical fitness and cyberbullying patterns (cybervictimization and cyberperpetration) in Spanish adolescents. *Behavioral Sciences, 13*, Article 952. https://doi.org/10.3390/bs13110952

Demirtaş-Madran, H. A. (2012). Validity and reliability study of the Turkish form of Buss-Perry aggression scale. *Turkish Journal of Psychology, 24*(2), 1-6. https://doi.org/10.5080/u6859

Eisenberg, N., Eggum, N. D., & Di Giunta, L. (2010). Empathy-related responding: Associations with prosocial behavior, aggression, and intergroup relations. *Social Issues and Policy Review*, *4*(1), 143-180. https://doi.org/10.1111/j.1751-2409.2010.01020.x

Erbiçer, E. S., Ceylan, V., Yalçın, M. H., Erbicer, S., Akın, E., Koçtürk, N., & Doğan, T. (2023). Cyberbullying among children and youth in Türkiye: A systematic review and meta-analysis. *Journal of Pediatric Nursing, 73*, 184-195. https://doi.org/10.1016/j.pedn.2023.09.003

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, *5*(1), 1-4. https://doi.org/10.11648/j.ajtas.20160501.11

Gámez-Guadix, M., Orue, I., K.Smith, P., & Calvete, E. (2013). Longitudinal and reciprocal relations of cyberbullying with depression substance use and problematic internet use among adolescents. *Journal of Adolescent Health*, *53*(4), 446 – 452. https://doi.org/10.1016/j.jadohealth.2013.03.030

Gençdoğan, B., & Çikrıkci, Ö. (2015). Validity and reliability studies of Turkish forms of e-bullying and e-victimization scale. *Theory and Practice in Education, 11*(1), 359-373.

George, D., & Mallery, P. (2019). *IBM SPSS statistics 26 step by step: A simple guide and reference*. Routledge.

Gini, G., & Pozzoli, T. (2013). Bullied children and psychosomatic problems: A meta-analysis. *Pediatrics, 132*(4), 720-729. https://doi.org/10.1542/peds.2013-0614

Giumetti, G. W., Kowalski, R. M., & Feinn, R. S. (2022). Predictors and outcomes of cyberbullying among college students: A two wave study. *Aggressive Behavior, 48*(1), 40-54. https://doi.org/10.1002/ab.21992

Guthold, R., A.Stevens, G., M.Riley, L., & C.Bull, F. (2018). Worldwide trends in insufficient physical activity from 2001 to 2016: a pooled analysis of 358 population-based surveys with 1·9 million participants. The Lancet Global Health. https://doi.org/10.1016/S2214-109X(18)30357-7

Haber, J. D., & Haber, S. B. (2007). Cyberbullying: A "virtual" camp nightmare? *Camping Magazine, 80*, 52-57.

Tabuk, M. E., &Akbaş, M. (2025). Relationship between physical activity habits, aggressive behaviour and cyberbullying among young adult university students. *Eurasian Journal of Sport Sciences and Education, 7*(1), 96-116.

Hemphill, S. A., Kotevski, A., & Heerde, J. A. (2015). Longitudinal associations between cyberbullying perpetration and victimization and problem behavior and mental health problems in young Australians. *International Journal of Public Health, 60*, 227-237.

Henson, B. (2012). Bullying beyond the schoolyard: Preventing and responding to cyberbullying. *Security Journal, 25*, 88–89. https://doi.org/10.1057/sj.2011.25

Hill, E. E., Zack, E., Battaglini, C., Viru, M., Viru, A., & Hackney, A. C. (2008). Exercise and circulating cortisol levels: The intensity threshold effect. *Journal of Endocrinology Investigation*, *31*(7), 587–591. https://doi.org/10.1007/BF03345606

Hinduja, S., & Patchin, J. W. (2008). Cyberbullying: An exploratory analysis of factors related to offending and victimization. *Deviant Behaviour, 29*(2), 129-156. https://doi.org/10.1080/01639620701457816

Hinduja, S., & Patchin, J. W. (2010). Bullying, cyberbullying, and suicide. *Archives of Suicide Research, 14*(3), 206-221. https://doi.org/10.1080/13811118.2010.494133

Hinduja, S., & Patchin, J. W. (2018). Connecting adolescent suicide to the severity of bullying and cyberbullying. *Journal of School Violence, 18*(3), 333–346. https://doi.org/10.1080/15388220.2018.1492417

Hofstede, G. (2013). Dimensionalizing cultures: The Hofstede Model in context. *Online Readings in Psychology and Culture, 2*(1), 1-26. https://doi.org/10.9707/2307-0919.1014

Hu, Y., Bai, Y., Pan, Y., & Li, S. (2021). Cyberbullying victimization and depression among adolescents: A meta-analysis. *Psychiatry Research, 305*, Article 114198. https://doi.org/10.1016/j.psychres.2021.114198

Jensen-Arnett, J. (2023). *Emerging adulthood: The winding road from the late teens through the twenties*. Oxford University Press.

Karakuş, S., & Turan, S. G. (2022). Examining the relationship between adults' cyberbullying behaviours and digital citizenship skills. *Pamukkale University Social Sciences Institute Journal*, (49), 409-427. https://doi.org/10.30794/pausbed.983075

Kraft, E. M., & Wang, J. (2010). An exploratory study of the cyberbullying and cyberstalking experiences and factors related to victimization of students at a public liberal arts college. *International Journal of Technoethics, 1*(4), 74-91. http://dx.doi.org/10.4018/jte.2010100106

Lam, L. T., & Li, Y. (2013). The validation of the E-Victimisation Scale (E-VS) and the E-Bullying Scale (E-BS) for adolescents. *Computers in Human Behaviour, 29*, 3-7. https://doi.org/10.1016/j.chb.2012.06.021

Leung, A. N. M., Wong, N., & Farver, J. M. (2018). Cyberbullying in Hong Kong Chinese students: Life satisfaction, and the moderating role of friendship qualities on cyberbullying victimization and perpetration. *Personality and Individual Differences, 133*, 7-12. https://doi.org/10.1016/j.paid.2017.07.016

Li, C., Wang, P., Martin-Moratinos, M., Bella-Fernández, M., & Blasco-Fontecilla, H. (2024). Traditional bullying and cyberbullying in the digital age and its associated mental health problems in children and adolescents: A meta-analysis. *European Child & Adolescent Psychiatry*, *33*(9), 2895-2909. https://doi.org/10.1007/s00787-022-02128-x

Lin, T.-W., & Kuo, Y.-M. (2013). Exercise benefits brain function: The monoamine connection. *Brain Sciences*, 3(1), 39–53. https://doi.org/10.3390/brainsci3010039

Lubans, D., Richards, J., Hillman, C., Faulkner, G., Beauchamp, M., Nilsson, M., ... & Biddle, S. (2016). Physical activity for cognitive and mental health in youth: A systematic review of mechanisms. *Pediatrics*, *138*(3). https://doi.org/10.1542/peds.2016-1642

LuisUbago-Jiménez, J., Cepero-González, M., Martínez-Martínez, A., & Chacón-Borrego, F. (2021). Linking emotional intelligence physical activity and aggression among undergraduates. *Int J Environ Res Public Health, 18*(23), Article 12477. https://doi.org/10.3390/ijerph182312477

Marciano, L., Schulz, P. J., & Camerini, A. L. (2022). Artificial intelligence in cyberbullying detection: Ethical and practical challenges. *Computers in Human Behaviour, 134*, 107327. https://doi.org/10.1016/j.chb.2022.107327

Morgan, C. T., & Arıcı, H. (1981). *Introduction to psychology: Textbook*. Hacettepe University.

Nesin, S. M., Sharma, K., Burghate, K. N., & Anthony, M. (2025). Neurobiology of emotional regulation in cyberbullying victims. *Frontiers in Psychology, 16*, Article 1473807. https://doi.org/10.3389/fpsyg.2025.1473807

Parks, J., Quarterman, J., & Thibault, L. (2003). *Contemporary sport management* (3. ed.). (N. Mirzeoğlu, Trans.). Academician Publishing (3rd Edt.), 6-7.

Pitts, B., Fielding, L. W., & Miller, L. K. (1994). Industry segmentation theory and the sport industry: Developing a sport industry segment model. *Sport Marketing Quarterly, 3*(1), 15-24.

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson.

Slonje, R., Smith, P. K., & Frisén, A. (2013). The nature of cyberbullying and strategies for prevention. *Computers in Human Behavior, 29*(1), 26-32. https://doi.org/10.1016/j.chb.2012.05.024

Smith, P., Mahdavi, J., Carvalho, M., Fisher, S., Russell, S., & Tippett, N. (2008). Cyberbullying: Its nature and impact in secondary school pupils. *Journal of Child Psychology and Psychiatry, 49*(4), 376-385. https://doi.org/10.1111/j.1469-7610.2007.01846.x

Suler, J. (2004). The online disinhibition effect. *CyberPsychology & Behaviour, 7*(3), 321-326. https://doi.org/10.1089/1094931041291295

Tabuk, M. E., & Karadağ, A. (2022). Investigation of corporate Twitter accounts of Beşiktaş, Fenerbahçe, Galatasaray and Trabzonspor clubs: A methodological study. *Journal of National Sport Science, 6*(2), 60-73. https://doi.org/10.30769/usbd.1211775

Tabuk, M. E. (2023). Determination of the relationship between attitude towards food supplements and physical health perception. *International Journal of Disabilities Sports and Health Sciences, 6*(3), 443-452. https://doi.org/10.33438/ijdshs.1323578

Taherdoost, H. (2016). Sampling methods in research methodology: How to choose a sampling technique for research. *International Journal of Academic Research in Management, 5*(2), 18-27. https://doi.org/10.2139/ssrn.3205035

Talwar, V., Gomez-Garibello, C., & Shariff, S. (2023). Sampling biases in aggression research: A systematic review. *Aggressive Behaviour, 49*(2), 123-135. https://doi.org/10.1002/ab.22088

Tran, H. G. N., Thai, T. T., Dang, N. T. T., Vo, D. K., & Duong, M. H. T. (2021). Cyber-Victimization and its effect on depression in adolescents: A systematic review and meta-analysis. *Trauma, Violence, & Abuse*, *24*(2), 1124-1139. https://doi.org/10.1177/15248380211050597

Tremblay, R. E. (2023). *Developmental origins of aggression*. Guilford Press.

Volk, A. A., Andrews, N. C., & Dane, A. V. (2022). Balance of power and adolescent aggression. *Psychology of Violence*, *12*(1), 31. https://doi.org/10.1037/vio0000398

Warburton, D. E. R., Nicol, C. W., & Bredin, S. S. D. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal, 174*(6), 801-809. https://doi.org/10.1503/cmaj.051351

Watts, L. K., Wagner, J., Velasquez, B., & Behrens, P. I. (2017). Cyberbullying in higher education: A literature review. *Computers in Human Behavior, 69*, 268-274. https://doi.org/10.1016/j.chb.2016.12.038

Willard, N. E. (2007). *Cyberbullying and cyberthreats: Responding to the challenge of online social aggression, threats, and distress*. Research Press.

Wilson, D., Witherup, K., & Payne, A. A. (2020). Risk and protective factors for cyberbullying perpetration and victimization. In T. J. Holt & A. M. Bossler (Eds.), *The Palgrave handbook of international cybercrime and cyberdeviance* (pp. 1257-1281). Springer. https://doi.org/10.1007/978-3-319-78440-3_56

Yaman, E., Eroğlu, Y., & Peker, A. (2011). *Coping strategies and school bullying and cyberbullying*. Kaknüs Publications.

Yaşartürk, F., Akay, B. & Kul, M. (2022). Investigation of negotiating with the barriers of leisure activities and agressive behavior in university students. *CBU Journal of Physical Education and Sport Sciences, 17*(2), 216-229. https://doi.org/10.33459/cbubesbd.1128967

Yazıcıoğlu, Y., & Erdoğan, S. (2014). *SPSS applied scientific research methods.* Detay Publishing.

Zhu, Y., Li, J., Zhang, M., Li, C., Lau, E. Y. H., & Tao, S. (2022). Physical activity participation and physical aggression in children and adolescents: A systematic review and meta-analysis. *Psychology of Sport and Exercise, 63*, Article 102288. https://doi.org/10.1016/j.psychsport.2022.102288

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The Relationship between Body Composition and Speed, Agility, and Strength Parameters in Regional Amateur League Football Players

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Abstract

This study aimed to determine the relationship between body composition and speed, agility, and strength parameters in regional amateur league football players. Thirteen male football players who played in regional amateur league competitions of the Turkish Football Federation voluntarily participated in the study. The football players underwent body analysis measurements as well as tests of 20-m sprint, Illinois agility, countermovement jump (CMJ), leg strength, and back strength. The SPSS package program was used for the relational and descriptive analysis of the data. The Pearson correlation test was performed to determine the relationships between variables in normally distributed data. Moderate positive correlations were found between the Illinois agility test results and body weight (r = .594; *p* = .032), fat mass (r = .579; *p* = .038), and basal metabolic rate (r = .613; *p* = .026), while a moderate negative relationship existed between fluid percentage (r = -.578; *p* = .038) and agility. There were moderate positive correlations between leg strength and fat-free percentage (r = .556; *p* = .048) and muscle percentage (r = .555; *p* = .049), and a moderate negative relationship between leg strength and fat percentage (r = -.556; *p* = .048). Moderate positive correlations were observed between back strength and fat-free percentage (r = .629; *p* = .021) and muscle percentage (r = .628; *p* = .022), while moderate negative relationships were observed between back strength and fat mass (r = -.587; *p* = .035) and fat percentage (r = -.629; *p* = .021). There were no significant relationships between the 20-m sprint and CMJ tests and body composition parameters (*p* > .05). In order to optimize the physical performance of football players, we recommended balancing the fluid percentage, limiting body fat, and increasing the muscle percentage.

Keywords: Football, Body composition, Biomotor characteristics

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INTRODUCTION

Football is an intermittent team sport characterized by frequent transitions between high-intensity movements such as running, jumping, shooting, acceleration, and deceleration, as well as low to moderate-intensity activities like running, walking, and even standing (Dugdale et al., 2019). In the sport of football, movements of varying intensities are applied at irregular intervals over a long period, while technical and tactical skills in addition to basic motor skills specific to football have great weight (Aslan, 2007). Football is a performance-oriented contact sport that involves repeated moderate to high-intensity sports activities, often with periods of submaximal work in between (Milanović et al., 2017). Although mainly aerobic, football also consists of high-intensity, intermittent exercises, including a large number of sprints, negative and positive acceleration, jumps, and movements requiring agility, for different durations (Shephard, 1999). In team games such as football, changing direction, advanced perceptual skills, and correct decision-making abilities are required to exhibit high performance (Loturco et al., 2017). In football, players gain motor skills as well as physical, mental, tactical, and technical skills (Kayantaş & Söyler, 2020).

Knowing the somatotype and body composition characteristics can provide a significant advantage in determining the abilities of the athlete, creating training programs to improve aerobic performance and technical skills, and selecting athletes with high potential for success (Apti, 2010). Body composition constitutes an important factor in athletic performance (Kızılca & Okut, 2024). The term "body composition" is widely used to describe the body in terms of conceptual models incorporating components of the body such as total mass, fat-free (lean) mass, and total fat mass (Ward, 2018). It is well known that in order to have a successful athletic career, both the athlete's physique and physical abilities must be suitable for sports (Yıldırım et al., 2024). Inappropriate body composition values can negatively affect joint and muscle health in athletes (Walsh et al., 2018). For this reason, studies have focused on the effects of athletes' physiological characteristics, body composition, and physical characteristics on sports performance.

The relationship between body composition and biomotor characteristics in sports represents a major research topic. Several studies have examined the relationship between body composition and biomotor characteristics in football players (Aktaş & Aslan, 2018; Anwar & Noohu, 2016; Çelik et al., 2022; Figueiredo et al., 2021). However, there are no studies examining the relationship between body composition and speed, agility, and strength parameters in regional amateur league football players. Hence, there has emerged a need to eliminate this gap in the research, by evaluating football players' performance on a scientific basis. Determining the relationship between body composition and speed, agility and strength in regional amateur league football players is important for improving the physical performance of players. Body composition includes factors such as fat ratio, muscle mass and bone structure, and these factors affect performance parameters such as speed, agility and strength. A good body composition

allows football players to use these features more efficiently and reduces the risk of injury. Understanding this relationship allows football players to perform more efficiently and healthily by preparing special training programs for them. The present study was thus designed to determine the relationship between body composition and speed, agility, and strength parameters in regional amateur league football players.

METHODS

Research Model

The research method employed in this study is the relational survey model, two or more variables are examined in order to determine whether they vary in tandem and if so, to what degree (Karasar, 2011).

Research Group

The minimum sample size for this study was calculated using G*Power software (version 3.1.9.7) (Faul et al., 2009). The analysis took into account an α error probability of 0.05, a statistical power of 0.80 (1-β error probability), and an effect size of 0.50. The findings showed that at least 10 participants were necessary to achieve the required statistical power. The experimental group in this study consisted of 13 male football players from the regional amateur football league of the Turkish Football Federation. All 13 players participated in this study on a voluntary basis.

Ethical Approval

This research was conducted in accordance with the ethical principles stated in the Declaration of Helsinki. Prior to the start of the study, ethical approval was obtained from the Scientific Research and Publication Ethics Committee of Muş Alparslan University, decision number 10/18, dated 16.10.2024.

Data Collection Tools

Athletes who would participate in the study were asked to sign a voluntary consent form. Athletes who had not had a serious chronic disease in the last year, who did not have serious muscle or bone problems, and who did not have to use medication on a regular basis were included in the study. All participants were informed to comply with healthy eating conditions throughout the study. They were also told to avoid intense exercise and not to consume caffeine-containing liquids for 24 hours before starting the measurements. In the course of this research, the participants were tested for body composition, 20-m sprint, the Illinois agility test, CMJ, and back and leg strength.

Body Composition Measurements

The height measurements of the football players were determined using a stadiometer. Body mass, body mass index (BMI), fat-free mass, fat-free percentage, muscle mass, muscle percentage, fat mass, fat percentage, fluid mass, fluid percentage, bone mineral mass, bone mineral content, and basal metabolic rate were all measured with a Tanita MC 780 MA brand bioelectrical impedance analyzer. Care was taken to ensure that all of the football players were tested at least two hours after eating. Body composition measurements were taken with the participants dressed in only shorts and t-shirts, after having relieved themselves (Kahraman & Arslan, 2023).

Biomotor Tests

20-m Sprint Tests

Fusion brand Smart Speed electronic photocell devices were placed at the start and end points of the running track for distances of 20 meter. The athletes began each sprint from 50 cm behind the start line and were allowed two attempts for each distance, with the best times being recorded.

Illinois Agility Test

The Illinois Agility Test was conducted to determine the athletes' agility. The test track was created by placing four funnels at intervals of 3.3 m in the midline, at a distance of 2.5 m from the sideline, where training cones were placed at the four corners of an area measuring 10 m long by 5 m wide. Fusion brand Smart Speed electronic photocell devices were placed at the start and end points of the track. The athletes began the test lying face down on the floor 30 cm behind the start line, with their arms at their sides and their heads turned to the side or facing forward. The participants made a straight run from the corner cone opposite the start line, turning towards the central cone located on the diagonal, then returned to the first center cone by slaloming between the center cones to complete a round trip. Next, they ran towards the other corner cone on the diagonal, circled the cone, and completed the test by crossing the finish line as quickly as possible. Photocell gates at the start and finish points recorded the running values of the athletes in seconds and fractions of a second. Each participant was given two attempts with a three-minute passive rest interval in between; the best score was recorded. A disqualification decision was made if the participant failed to run the course, reach the finish line, complete the course, or skip any cone as instructed (Raya et al., 2013).

Countermovement Jump (CMJ) Test

The CMJ tests of the athletes were measured using an electronic Fusion brand Smart Jump jump mat. All athletes were instructed to climb onto the mat with their hands on their waists, and when ready, to jump as high as possible. After each jump, the athletes fell back onto the mat. The jump heights were measured in cm and the best result out of two attempts was recorded (Atan, 2019).

Back Strength

The back strength of the athletes was measured with a Takei brand (Japan) back dynamometer. The athletes were placed on the dynamometer stand, pressing on the section with the foot marks. They were instructed to grasp the dynamometer bar with their hands upside down (palms up), with their knees and arms tense, backs straight and torsos tilted slightly forward. While in this position, the length of the dynamometer chain was adjusted according to the physical characteristics of each athlete, who was then instructed to pull the dynamometer bar vertically, to the maximum level. The test was performed twice and the best value was recorded in kg.

Leg Strength

The leg strength of the athletes was measured with a Takei brand (Japan) leg dynamometer. The participants were placed on the dynamometer stand, pressing on the section with the foot marks. They were instructed to grasp the dynamometer bar with their hands straight (palms down) and with their knees bent, arms stretched, backs straight and torsos tilted slightly forward. While in this position, the length of the dynamometer chain was adjusted according to the physical characteristics of each athlete, who was then instructed to pull the dynamometer bar vertically, to the maximum level. The test was performed twice and the best value was recorded in kg.

Statistical Analysis

The SPSS (Statistical Package for the Social Sciences) program was used for relational and descriptive analysis of the data. The normality level of the data was determined by the Shapiro-Wilk test. The Pearson correlation test was performed to determine the relationships between variables in normally distributed data. In this study, the level of statistical significance was accepted as a value of $p < .05$.

RESULTS

Results of the descriptive statistics for the biomotor tests of the participating regional amateur league football players (mean age: 19.54±2.15 years) are presented in Tables 1.

Table 1. Biomotor tests descriptive statistics results

Biomotor Tests	Mean	Std. Dev.	Min.	Max.
20-m Sprint (sec)	3.09	0.17	2.73	3.33
Illinois Agility (sec)	16.65	1.22	15.06	18.59
CMJ (cm)	36.13	5.13	27.78	41.67
Leg Strength (kg)	129.38	25.81	89.50	177.50
Back Strength (kg)	123.88	20.59	91.50	157.50

n=13

Results of the descriptive statistics for the body composition measurements of the participating regional amateur league football players are presented in Tables 2.

Table 2. Body composition descriptive statistics results

Body Composition	Mean	Std. Dev.	Min.	Max.
Height (cm)	181.15	6.71	170.00	189.00
Body Weight (kg)	74.42	9.60	58.40	93.00
Body Mass Index (BMI) (kg/m2)	22.60	1.77	19.30	26.00
Fat-free Mass (kg)	63.59	6.03	54.10	74.90
Fat-free Percentage (%)	85.89	4.79	76.45	92.64
Fat Mass (kg)	10.82	4.90	4.30	21.90
Fat Percentage (%)	14.11	4.79	7.36	23.55
Muscle Mass (kg)	60.43	5.74	51.40	71.20
Muscle Percentage (%)	81.62	4.53	72.68	88.01
Fluid Mass (kg)	43.86	3.14	37.70	49.30
Fluid Percentage (%)	59.37	3.85	51.94	65.06
Bone Mineral Mass (kg)	3.83	0.83	2.81	5.47
Bone Mineral Content (%)	5.03	1.09	3.09	6.54
Basal Metabolic Rate (kcal)	1.93	0.19	1.61	2.25

n = 13

The results of the relationship between body composition and speed, agility and strength parameters in regional amateur league football players are presented in Table 3.

Table 3. Biomotor tests and body composition pearson correlation test results

Variables		20-m Sprint (sec)	Illinois Agility (sec)	CMJ (cm)	Leg Strength (kg)	Back Strength (kg)
Height (cm)	r	-.062	.309	-.389	-.019	-.018
	p	.841	.304	.188	.951	.953
Body Mass (kg)	r	.147	.594*	-.517	-.355	-.372
	p	.633	.032	.070	.234	.210
Fat-free Mass (kg)	r	-.120	.476	-.449	-.160	-.116
	p	.695	.100	.124	.600	.706
Fat-free Percentage (%)	r	-.502	-.524	.392	.556*	.629*
	p	.080	.066	.185	.048	.021
Fat Mass (kg)	r	.436	.579*	-.461	-.498	-.587*
	p	.137	.038	.113	.083	.035
Fat Percentage (%)	r	.502	.524	-.392	-.556*	-.629*
	p	.080	.066	.185	.048	.021
Muscle Mass (kg)	r	-.118	.478	-.451	-.162	-.118
	p	.700	.099	.122	.596	.701
Muscle Mass Percentage (%)	r	-.502	-.523	.390	.555*	.628*
	p	.080	.067	.188	.049	.022
Fluid Mass (kg)	r	-.052	.517	-.436	-.264	-.249
	p	.865	.070	.136	.384	.412
Fluid Percentage (%)	r	-.331	-.578*	.512	.429	.435
	p	.270	.038	.074	.144	.137
Bone Mineral Mass (kg)	r	.049	.122	-.185	-.391	-.245
	p	.874	.692	.546	.186	.419
Bone Mineral Content (%)	r	-.001	-.172	.083	-.231	-.126
	p	.997	.573	.788	.448	.682
Basal Metabolic Rate (kcal)	r	-.007	.613*	-.545	-.219	-.245
	p	.981	.026	.054	.472	.420

*$p < .05$; **$p < .01$; n = 13

For the participating football players, a moderate positive correlation was found between the Illinois agility test and body mass (r = .594; *p* = .032), fat mass (r = .579; *p* = .038), and basal metabolic rate (r = .613; *p* = .026), while a moderate negative correlation was observed between agility and fluid percentage (r = -.578; *p* = .038).

There was a moderate positive correlation between the participants' leg strength and fat-free percentage (r = .556; *p* = .048) and muscle percentage (r = .555; *p* = .049) and a moderate negative relationship between leg strength and fat percentage (r = -.556; *p* = .048).

A moderate positive correlation was observed between back strength and fat-free percentage (r = .629; *p* = .021) and muscle percentage (r = .628; *p* = .022) in the participating football players, whereas moderate negative relationships were detected between fat mass (r = -.587; *p* = .035) and fat percentage (r = -.629; *p* = .021).

There were no significant relationships between the body composition parameters and either the 20-m sprint or CMJ tests in the participating regional amateur league football players (*p* > .05 for all).

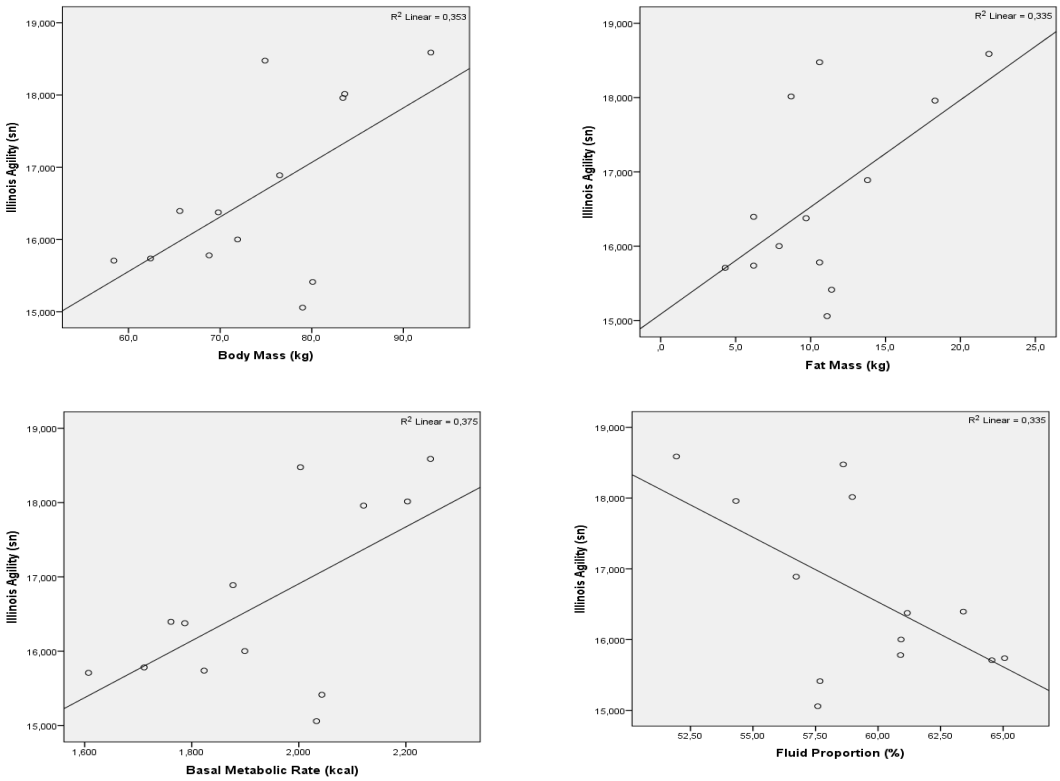

Figure 1. The relationship between the Illinois agility test and body mass, fat mass, basal metabolic rate, and fluid proportion

As the participants' body weight, fat mass, and basal metabolic rate increased, their Illinois agility test times were also observed to increase, indicating diminished agility. In contrast, as

fluid percentages increased, their agility test times decreased, reflecting an improvement in agility performance.

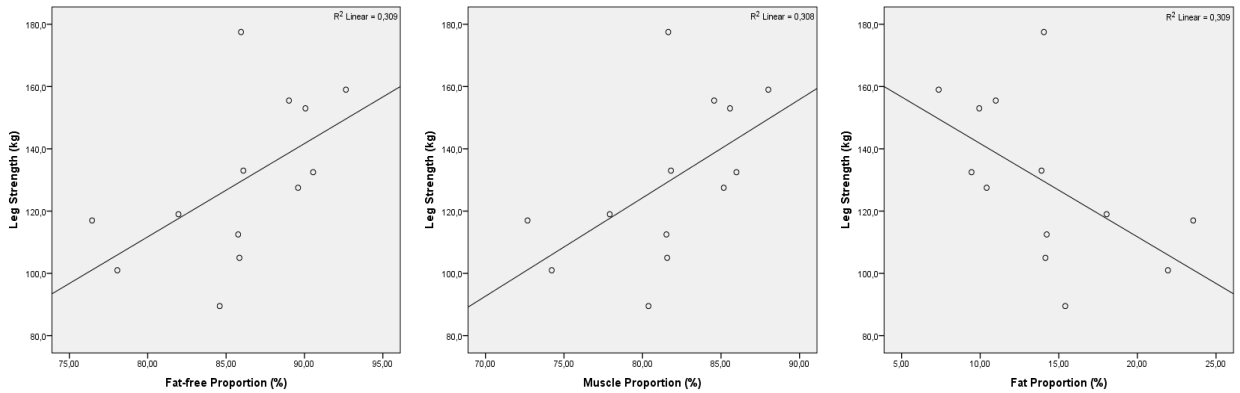

Figure 2. The relationship between leg strength and fat-free, muscle and fat proportions

In the participating football players, leg strength was found to increase with higher fat-free and muscle percentages, whereas leg strength decreased with increased fat percentage.

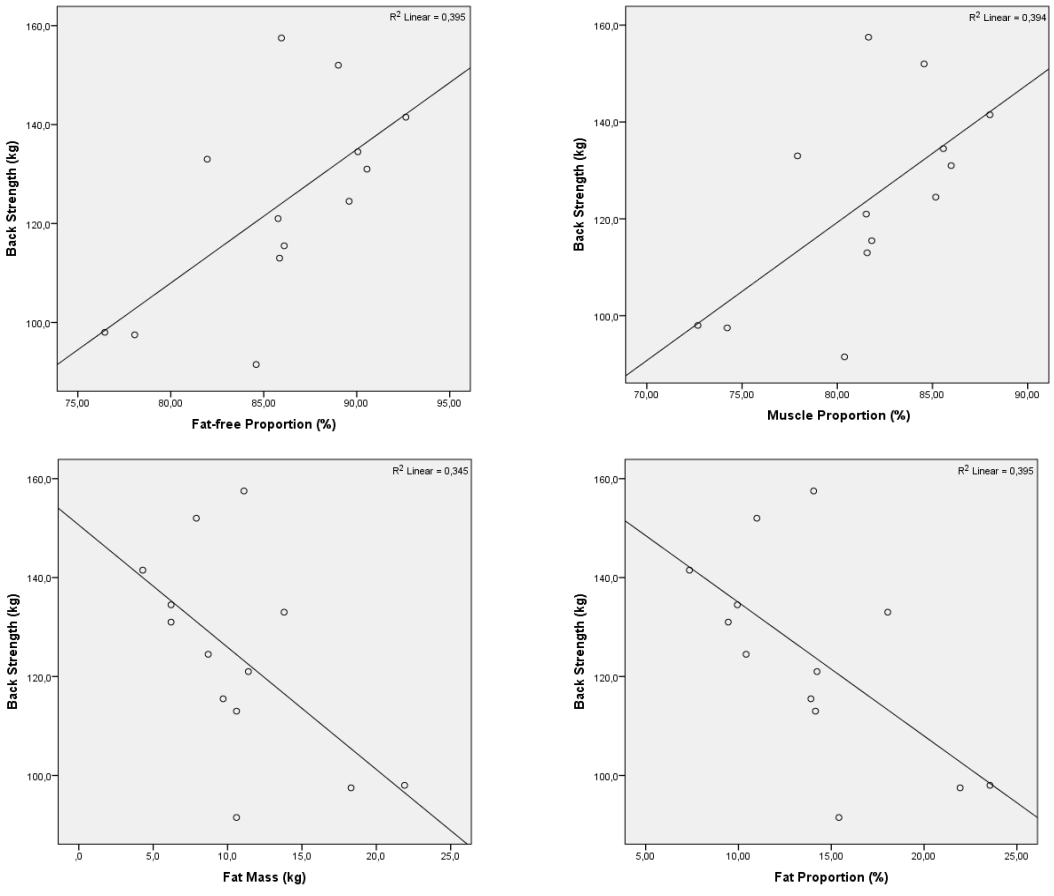

Figure 3. The relationship between back strength and fat-free proportion, muscle proportion, fat mass, and fat proportion

With increases in the participants' fat-free and muscle proportions, back strength also increased, while back strength decreased with increased fat mass and fat percentage.

DISCUSSION

The present study aimed to determine the relationship between body composition and speed, agility, and strength parameters in regional amateur league male football players. Concerning the 20-m sprint, there were no significant relationships between this test and body composition parameters in the participating football players. Aktaş and Aslan (2018), on the other hand, observed a moderate positive relationship between the body fat percentages of football players and their 10-m and 30-m sprint performances. Anwar and Noohu (2016) similarly reported a moderately significant positive relationship between body fat percentage and 30-m sprint speeds in university football players. The discrepancy between the results of our research and those of studies reported in the literature may be due to category and age variables. In another study conducted with U18 male football players, there was a weak negative relationship between the 20-m speed test and fluid mass, while no significant difference was found between the 20-m speed test and other body composition parameters (Kahraman & Arslan, 2023). Time-motion analyses reveal that football players frequently perform short sprints, with the flat sprint being the most common movement performed prior to goals, both in terms of scoring goals and assisting teammates (Haugen et al., 2014). Additionally, players' body composition may also affect their performance, helping to improve factors such as agility and speed. A study on young football players has revealed that sprint profiles are strongly correlated with both chronological age and maturity offset, independent of body size and training experience (Fernández-Galván et al., 2021).

In regard to the Illinois agility test, our study found moderate positive relationships between agility and body weight, fat mass, and basal metabolic rate, whereas a moderate negative relationship was observed between agility and fluid percentage in the participating regional amateur league football players. Agility is a very important component of overall health and fitness (Tabacchi et al., 2018). This feature allows individuals to change direction quickly and react quickly, significantly improving their physical performance. In addition, the development of agility improves body coordination and strengthens overall physical fitness. The knowledge of movements requiring agility, such as sudden stops and changing direction, among the basic features of football is evidence of the importance of agility for football players (Aktaş et al., 2020). The observed accelerations of football players are primarily performed in response to external stimuli (i.e., the movement of the ball, opponent, or teammates) and are typically prioritized with a change in direction of movement (Krolo et al., 2020). Cheuvront et al. (2008) emphasize that fluid intake has a direct effect on agility, endurance and explosive strength. Kahraman and Arslan (2023) failed to find a significant relationship between the T agility test and body composition parameters in their study of football players. A study conducted on

adolescent male football players showed that body fat percentage was positively correlated with speed and agility at a moderate level across all age groups (França et al., 2022). This result does not align with the findings of the present study and may have resulted from the different agility tests applied.

No significant relationships were found between the CMJ test and various body composition parameters in the participating football players. Vertical jumping is a complex movement involving more than one joint and requires great muscle strength in the hips, knees, and ankles (Okut & Kızılca, 2024). Concerning the biomechanics of vertical jumping, the contraction levels of the hamstrings and quadriceps femoris muscles represent an important factor, and vertical pushing motion reflects the existence and significance of explosive power (Karadağ et al, 2024). In their study on U-18 male football players, Kahraman and Arslan (2023) found weak positive relationships between vertical jump and fat-free mass, muscle mass, and basal metabolic rate, and a moderate positive relationship between vertical jump and fluid mass. Figueiredo et al. (2021) observed negative relationships between body fat percentage and bounce performance in professional football players. In a study investigating the relationship between body fat percentage and performance parameters in football players, a moderately significant negative correlation was found between body fat percentage and vertical jump (Anwar & Noohu, 2016). Çelik et al. (2022) reported a weak negative relationship between the body fat percentage and vertical jump performance of football players. Another study conducted with football players found a strong negative correlation between vertical jump performance and body fat percentage (Esco et al., 2018). The results obtained in our research are not consistent with those of the abovementioned studies. This discrepancy is thought to derive from categorical and characteristic differences in the training levels and experimental groups.

In the present study, a moderate positive relationship was found between leg strength and fat-free muscle percentages, while a moderate negative relationship was observed between the leg strength and fat percentage of the participating athletes. For these regional amateur league football players, there were moderate positive relationships between back strength and fat-free and muscle percentages; in contrast, moderate negative relationships were observed between back strength and fat mass and fat percentage. Football players, who are constantly in motion during matches, require strength for every movement they make while playing (Yarayan & Müniroğlu, 2020). When body composition comes together with other performance elements such as the athlete's strength, flexibility, speed, endurance and agility, it emerges as only one of the high-level performance indicators and positively affects the athlete's performance (Asan, 2023). Ben Mansour et al. (2021) examined the effect of body composition on strength and power in male and female students and determined that excess body fat ratio reduces strength levels. Silvestre et al. (2006) investigated the relationship between body composition parameters and physical performance of football players and found significant correlations between total body fat ratio and physical performance parameters.

CONCLUSIONS

In conclusion, our findings showed that with increases in body weight, fat mass, and basal metabolic rate the participating amateur football players, Illinois agility test times increased, indicating diminished agility. In contrast, with increased fluid percentage, agility test times decreased, evidence of improved agility performance. Both leg strength and back strength increased as the participants' fat-free and muscle percentages increased, while leg strength and back strength decreased with increased fat percentage. Increased fat mass was also associated with decreased back strength. In line with these results, it is important for regional amateur league football players to improve their body composition in order to increase their performance. In particular, reducing body fat and increasing muscle mass can improve agility performance and increase leg and back strength. In training programs, it is recommended that football players work to increase muscle mass and reduce fat. In addition, increasing fluid consumption can positively affect agility performance. Football players should be provided with nutritional and training guidance to manage body weight and fat mass, aiming to optimize both agility and strength parameters.

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Authors' Contribution: Research Design-MZK, SO, Data Collection- SO, IÇ, Statistical Analysis- MZK, Preparation of the Article, MZK, SO, IÇ.

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Ethics Committee: Muş Alparslan University Scientific Research and Publication Ethics Committee Ethics Committee
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REFERENCES

Aktaş, H. N., & Aslan, C. S. (2018). Amatör futbolcularda vücut kompozisyonu ile sürat arasındaki ilişkinin incelenmesi [Examination of the relationship between body composition and speed in amateur football players]. *Çanakkale Onsekiz Mart Üniversitesi Spor Bilimleri Dergisi, 1*(1), 17-25.

Aktaş, S., Uçar, U., M., & Kaplan, T. (2020). Mevkilerine göre amatör futbolcularda seçilmiş performans parametreleri ile çeviklik arasındaki ilişki [The relationship between selected performance parameters and agility in amateur football players according to their positions]. *Spor ve Performans Araştırmaları Dergisi, 11*(2), 112-119. https://doi.org/10.17155/omuspd.620634

Anwar, S., & Noohu, M. M. (2016). Correlation of percentage body fat and muscle mass with anaerobic and aerobic performance in collegiate soccer players. *Indian J Physiol Pharmacol, 60*(2), 137-144.

Apti, A. (2010). 10-18 yaş erkek futbolcularda somatotip ve vücut kompozisyonunun aerobik performans ve yaşanan sportif yaralanmalar ile ilişkisinin değerlendirilmesi [Evaluation of the relationship between somatotype and body composition, aerobic performance and sports injuries in male football players aged 10-18 years]. *Fırat Tıp Dergisi*, *15*(3), 118-122.

Asan, S. (2023). Adölesan sporcularda vücut kompozisyonu ile sürat arasındaki ilişkinin incelenmesi [Investigation of the relationship between body composition and speed in adolescent athletes]. *Kafkas Üniversitesi Spor Bilimleri Dergisi*, *3*(3), 14–23. https://doi.org/10.1501/Sporm_0000000108

Aslan, A. (2007). *Futbolda oyun dinamiklerinin incelenmesi ve değerlendirilmesi [Analysis and evaluation of game dynamics in football]*. Yayımlanmamış Doktora Tezi, Hacettepe Üniversitesi Sağlık Bilimleri Enstitüsü, Ankara.

Atan, T. (2019). The effect of different warm-up protocols on joint range of motion, jump, and sprint performance. *OPUS International Journal of Society Researches, 13*(19), 621–635. https://doi.org/10.26466/opus.574260

Ben Mansour, G., Kacem, A., Ishak, M., Grélot, L., & Ftaiti, F. (2021). The effect of body composition on strength and power in male and female students. *BMC Sports Science, Medicine and Rehabilitation*, *13*, 1–11. https://doi.org/10.1186/s13102-021-00376-z

Cheuvront, S. N., Carter, R., & Sawka, M. N. (2008). Fluid balance and endurance performance. *Sports Medicine*, *38*(1), 1-8. https://doi.org/10.1249/00149619-200308000-00006

Çelik, S., Örer, G. E., Diler, K., & Yelken, M. E. (2022). Futbolcuların vücut yağ yüzdesi ile sürat ve dikey sıçrama performansları arasındaki ilişkinin incelenmesi [Examination of the relationship between body fat percentage and speed and vertical jump performances of football players]. *Gazi Beden Eğitimi ve Spor Bilimleri Dergisi, 27*(4), 313-332. https://doi.org/10.53434/gbesbd.1134779

Dugdale, J. H., Arthur, C. A., Sanders, D., & Hunter, A. M. (2019). Reliability and validity of field-based fitness tests in youth soccer players. *European Journal of Sport Science*, *19*(6), 745-756. http://doi.org/10.1080/17461391.2018.1556739

Esco, M. R., Fedewa, M. V., Cicone, Z. S., Sinelnikov, O. A., Sekulic, D., & Holmes, C. J. (2018). Field-based performance tests are related to body fat percentage and fat-free mass, but not body mass index, in youth soccer players. *Sports, 6*(4), 105. https://doi.org/10.3390/sports6040105

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G* Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149-1160. https://doi.org/10.3758/BRM.41.4.1149

Fernández-Galván, L. M., Boullosa, D., Jiménez-Reyes, P., Cuadrado-Peñafiel, V., & Casado, A. (2021). Examination of the sprinting and jumping force-velocity profiles in young soccer players at different maturational stages. *International Journal of Environmental Research and Public Health*, *18*(9), 4646. https://doi.org/10.3390/ijerph18094646

Figueiredo, D. H., Dourado, A. C., Stanganelli, L. C. R., & Gonçalves, H. R. (2021). Evaluation of body composition and its relationship with physical fitness in professional soccer players at the beginning of pre-season. *Retos: Nuevas Tendencias en Educación Física, Deporte y Recreación*, (40), 117-125. https://doi.org/10.47197/retos.v1i40.82863

França, C., Gouveia, É., Caldeira, R., Marques, A., Martins, J., Lopes, H., Henriques, R., & Ihle, A. (2022). Speed and Agility Predictors among Adolescent Male Football Players. *International Journal of Environmental Research and Public Health, 19*(5), 2856. https://doi.org/10.3390/ijerph19052856

Haugen, T. A., Tønnessen, E., Hisdal, J., & Seiler, S. (2014). The role and development of sprinting speed in soccer. *International Journal of Sports Physiology and Performance*, *9*(3), 432-441. https://doi.org/10.1123/ijspp.2013-0121

Kahraman, M. Z., & Arslan, E. (2023). The relationship between body composition and biomotor performance parameters in U18 football players. *Physical Education of Students, 27*(1), 45-52. https://doi.org/10.15561/20755279.2023.0106

Karadağ, A. D., Boyraz, E., Çoban, R., Özdabakoğlu, M. V., & Bacak, N. (2024). Kadın voleybolcularda vücut kompozisyonu ile sıçrama parametreleri arasındaki ilişkinin incelenmesi [Examination of the relationship between body composition and jumping parameters in female volleyball players]. *Journal of Human Sciences, 21*(1), 62-72. https://doi.org/10.14687/jhs.v21i1.6463

Karasar, N. (2011). *Bilimsel araştırma yöntemi [Scientific research method]*. Nobel Yayınevi.

Kayantaş, İ., & Söyler, M. (2020). Dar alan antrenmanlarının bölgesel amatör lig futbolcularında bazı fiziksel parametreler üzerindeki etkisi [Effects of small-sided training on some physical parameters in regional amateur league football players]. *Herkes için Spor ve Rekreasyon Dergisi, 2*(2), 81-88.

Kızılca, S., & Okut, S. (2024). Genç erkek boksörlerde dinamik ısınma egzersiz sürelerinin farklı atlama tiplerine etkisi [The effects of dynamic warm-up exercise durations on different jump types in young male boxers]. *Türk Spor ve Egzersiz Dergisi, 26*(2), 236-244. https://doi.org/10.15314/tsed.1399694

Krolo, A., Gilic, B., Foretic, N., Pojskic, H., Hammami, R., Spasic, M., Uljevic, O., Versic, S., & Sekulic, D. (2020). Agility Testing in Youth Football (Soccer)Players; Evaluating Reliability, Validity, and Correlates of Newly Developed Testing Protocols. I*nternational Journal of Environmental Research and Public Health, 17*(1), 294. https://doi.org/10.3390/ijerph17010294

Loturco, I., Kobal, R., Kitamura, K., Cal Abad, C. C., Faust, B., Almeida, L., & Pereira, L. A. (2017). Mixed training methods: effects of combining resisted sprints or plyometrics with optimum power loads on sprint and agility performance in professional soccer players. *Frontiers in Physiology*, *8*, Article 1034. https://doi.org/10.3389/fphys.2017.01034

Milanović, Z., Sporiš, G., James, N., Trajković, N., Ignjatović, A., Sarmento, H., ... & Mendes, B. M. B. (2017). Physiological demands, morphological characteristics, physical abilities and injuries of female soccer players. *Journal of Human Kinetics, 60*, 77-83. https://doi.org/10.1515/hukin-2017-0091

Okut, S., & Kızılca, S. (2024). The effects of open and closed kinetic chain exercises on visual reaction times and certain motor skills in young male boxers. *Anemon Muş Alparslan Üniversitesi Sosyal Bilimler Dergisi, 12*(2), 373-383. https://doi.org/10.18506/anemon.1398291

Raya, M. A., Gailey, R. S., Gaunaurd, I. A., Jayne, D. M., Campbell, S. M., Gagne, E., Manrique, P. G., Muller, D.G., & Tucker, C. (2013). Comparison of three agility tests with male servicemembers: Edgren side step test, T-Test, and Illinois agility test. *Journal of Rehabilitation Research & Development, 50*(7), 951-960. https://doi.org/10.1682/jrrd.2012.05.0096

Shephard, R. J. (1999). Biology and medicine of soccer, an update. *Journal of Sports Sciences, 17*(10), 757-786. https://doi.org/10.1080/026404199365498

Silvestre, R., West, C., Maresh, C. M., & Kraemer, W. J. (2006). Body composition and physical performance in men's soccer: A study of a National Collegiate Athletic Association Division I team. *Journal of Strength & Conditioning Research, 20*(1), 177–183. https://doi.org/10.1519/R-17715.1

Tabacchi, G., Faigenbaum, A., Jemni, M., Thomas, E., Capranica, L., Palma, A., ... & Bianco, A. (2018). Profiles of physical fitness risk behaviours in school adolescents from the ASSO project: a latent class analysis. *International Journal of Environmental Research and Public Health*, *15*(9), 1933. http://doi.org/10.3390/ijerph15091933

Walsh, T. P., Arnold, J. B., Evans, A. M., Yaxley, A., Damarell, R. A., & Shanahan, E. M. (2018). The association between body fat and musculoskeletal pain: A systematic review and meta-analysis. *BMC Musculoskeletal Disorders*, *19*, 1-13. https://doi.org/10.1186/s12891-018-2137-0

Ward, L. C. (2018). Human body composition: yesterday, today, and tomorrow. *European Journal of Clinical Nutrition, 72*(9), 1201-1207. https://doi.org/10.1038/s41430-018-0210-2

Yarayan, M. T., & Müniroğlu, S. (2020). Sekiz haftalık pliometrik antrenman programının 13-14 yaş grubu futbolcularda dikey sıçrama, çeviklik, sürat ve kuvvet parametreleri üzerine etkisi [The effect of an eight-week plyometric training program on vertical jump, agility, speed and strength parameters in 13-14 age group football players]. *SPORMETRE Beden Eğitimi ve Spor Bilimleri Dergisi, 18*(4), 100-112. https://doi.org/10.33689/spormetre.679445

Yıldırım, S., Demirli, A., Günendi, G., & Akyüz, Ö. (2024). Güreşçilerin vücut kompozisyonu ve çeviklik seviyelerinin beceri üzerindeki etkisi [The effect of wrestlers' body composition and agility levels on skill]. *Akdeniz Spor Bilimleri Dergisi*, *7*(3), 604-614. https://doi.org/10.38021/asbid.1534207

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Is the Organizational Structure Faculties of Sport Sciences Mechanistic or Organic?

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Abstract

The aim of this study was to examine the perceptions of academic staff working at Faculties of Sports Sciences regarding their institutions' organizational structures and to classify these structures as mechanistic or organic. The theoretical foundation of this research is based on Burns and Stalker's organizational classification model, highlighting that organizational effectiveness can significantly vary according to structural characteristics in dynamic fields such as sports sciences. The theoretical rationale for this study arises from the need to better understand how organizational structures impact the adaptability and innovation capacity of academic institutions in response to rapid developments and interdisciplinary demands within the field of sports sciences. Data were collected from 332 academic staff across various sports sciences faculties in Turkey using the "Organizational Structure Scale–University Version." Data were collected in 2024. The analysis indicated that academic staff predominantly perceive their institutions as having a mechanistic structure characterized by high levels of complexity, centralization, and formalization, along with lower levels of stratification. These findings provide significant theoretical contributions by highlighting the prevalence of mechanistic structures that may affect academic creativity, organizational effectiveness, and adaptability in a rapidly evolving academic discipline. Therefore, this study emphasizes the necessity of transitioning toward more organic and flexible organizational models to promote innovation, interdisciplinary collaboration, and institutional responsiveness, thus potentially contributing substantially to the literature on organizational theory in sports sciences.
Keywords: Faculty of Sport Sciences, Organizational structure, Mechanical and organic organization

Spor Bilimleri Fakültelerinde Organizasyon Yapısı Mekanik mi, Organik mi?

Öz

Bu çalışmanın amacı, Spor Bilimleri Fakültelerinde görev yapan akademik personelin kurumlarının örgütsel yapılarına ilişkin algılarını incelemek ve bu yapıları mekanistik veya organik olarak sınıflandırmaktır. Araştırmanın teorik temeli, Burns ve Stalker'ın örgütsel sınıflandırma modeline dayanmakta olup, spor bilimleri gibi dinamik alanlarda örgütsel etkinliğin, yapısal özelliklere göre önemli ölçüde farklılık gösterebileceği vurgulanmaktadır. Araştırmanın teorik gerekçesini, spor bilimleri alanında hızlı gelişmelerin ve disiplinler arası taleplerin ortaya çıkardığı değişimlere kurumların uyum sağlama ve yenilikçilik kapasiteleri üzerinde örgütsel yapıların etkisini daha iyi anlamak oluşturmuştur. Türkiye genelindeki çeşitli spor bilimleri fakültelerinde görev yapan 332 akademik personelden "Örgütsel Yapı Ölçeği–Üniversite Versiyonu" kullanılarak veri toplanmıştır. Veriler 2024 yılında toplanmıştır. Yapılan analiz sonucunda akademik personelin kurumlarını ağırlıklı olarak mekanistik yapıda algıladıkları; yüksek düzeyde karmaşıklık, merkezileşme ve biçimselleşmenin yanı sıra düşük düzeyde tabakalaşma özelliklerinin öne çıktığı belirlenmiştir. Bu bulgular, hızla gelişen bir akademik disiplinde, mekanistik yapıların yaygınlığının akademik yaratıcılık, örgütsel etkinlik ve uyum sağlama becerilerini nasıl etkileyebileceğine yönelik önemli teorik katkılar sunmaktadır. Dolayısıyla bu çalışma, yenilikçiliği, disiplinler arası iş birliğini ve kurumsal duyarlılığı teşvik etmek için daha organik ve esnek örgütsel modellere geçişin gerekliliğini vurgulayarak spor bilimleri alanındaki örgüt teorisi literatürüne önemli bir katkı sağlayacağı düşünülmektedir.
Anahtar kelimeler: Spor Bilimleri Fakültesi, Örgütsel yapı, Mekanik ve organik örgüt

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INTRODUCTION

To understand organizational structure, it is essential to first focus on the concept of an organization. An organization can be defined as a community of individuals brought together to achieve a common goal. In this context, establishing an organizational structure requires arrangements related to fundamental activities, analysis of personnel and tasks, and coordination of their interrelations (Koçel, 2018). Thus, organizational structure pertains to the arrangement of tasks and operations within institutions and organizations to accomplish predetermined core missions, assigning personnel to specific positions and roles, and organizing the relationships among these positions (Özcan, 2010). Simply put, structure refers to the form of the units that constitute an organization and the relationships among these units (İçerli, 2009). When creating an organizational structure, activities and division of labor within the organization, the levels of expertise required for the tasks, management style, coordination methods, and the functions of the organization must be evaluated from a holistic perspective (Altunay, 2006).

Mintzberg (2015) explains organizational structure types based on fundamental coordination mechanisms, types of decentralization, and differentiation of the organization's core unit. These structure types are as follows:

- The Simple Structure: Also referred to as the "entrepreneurial organization," this structure is characterized by high levels of direct supervision and centralization, with minimal complexity and few hierarchical layers (Hoy & Miskel, 2015; Robbins & Judge, 2017).
- The Machine Bureaucracy: This structure is distinguished by standardized work processes, formal communication channels, and a hierarchical authority framework. It features high centralization and formality (Hoy & Miskel, 2015; Weber, 1947).
- The Professional Bureaucracy: Combining both horizontal and vertical decentralization with standardization, this structure relies on knowledge and expertise as the foundation of authority. In this model, the skills and knowledge acquired during professionals' training are of significant importance (Hoy & Miskel, 2015; Lunenburg & Ornstein, 2013).
- The Divisionalized Form: As organizations grow, they may establish divisions based on geography, product, or function. These divisions operate autonomously while overall policies and strategies are set by the top strategic management (Lunenburg & Ornstein, 2013; Mintzberg, 1979, 1993).
- The Adhocracy: This highly organic structure is characterized by low formalization and a horizontal hierarchy. Specialists collaborate on innovative projects, with mutual adjustment serving as the primary coordination mechanism (Lunenburg & Ornstein, 2013; Mintzberg, 1993).

The classification of organic and mechanistic organizational structures is one of the frequently cited classifications in the literature, developed by Burns and Stalker (1968). Through their examination of twenty industrial firms in England, Stalker and Burns observed a connection between the existing organizational structure and the external environment influencing the

organization. They found that when the external environment is stable and static, organizations exhibit a high level of formalization, implement standardized rules and procedures, and maintain a clear hierarchy of authority. In such structures, decision-making is concentrated at the upper levels of management, resulting in a high degree of centralization. Burns and Stalker (1968) defined these types of structures as *mechanistic organizational structures* (as cited in Daft, 2010).

Table 1. Comparison of mechanistic and organic organizations

Mechanistic Organization	Organic Organization
High specialization	Cross-functional teams
Rigid departmentalization	Cross-hierarchical teams
Clear chain of command	Flexible flow of information
Narrow span of control	Wide span of control
Centralization	Decentralization
High formalization	Low formalization

Robbins & Judge, (2013)

Tom Burns and G.M. Stalker (1968), in their comparative analyses of organizational structures, argued that under continuously changing environmental conditions, there cannot be a single "best" organizational structure. Their research highlighted the appropriateness of aligning organizational structures with dynamic environmental conditions. Accordingly, they emphasized that mechanistic structures are more suitable for stable environments, whereas organic structures are better suited for variable and dynamic environments. They advised managers to consider these factors when shaping organizational structures (as cited in Koçel, 2018).

When examining some studies in the literature regarding organizational structure, Yıldırım (2014) states that schools generally exhibit an organic organizational structure characterized by low specialization and centralization, and high formalization. However, he also notes that certain legal regulations may negatively affect job satisfaction. Similarly, Alanoğlu and Demirtaş (2020) found that a bureaucratic (enabling) structure positively relates to school principals' collaborative management style, whereas a hindering structure positively relates to authoritarian and indifferent management styles.

Alavi et al. (2014) indicated that decentralization and flat structures within organic organizations enhance workforce agility, while organizational learning also positively impacts agility. Agbim (2013) argues that organic structures are more effective in generating innovative ideas, whereas mechanistic structures facilitate the implementation of these ideas, emphasizing the influential role of leadership styles during these processes. Kessler et al. (2017) noted that organic structures support innovation and employee satisfaction, while mechanistic structures focus on clear role definitions and hierarchy. Sine et al. (2006) argued that mechanistic structures are beneficial for performance in the initial phases of new ventures.

Aksay (2015) highlighted the evolution of organizational structures towards horizontal configurations and emphasized the prominence of modern organization types such as network,

virtual, and learning organizations. Bozkuş (2016) pointed out that flexible structures in educational institutions contribute positively to educational quality.

In conclusion, organic structures support innovation, collaboration, and agility, whereas mechanistic structures provide advantages in clarity of roles and implementation processes. The selection of an organizational structure should consider the environmental conditions of the institutions.

In this context, examining the perceptions of organizational structures among academics in faculties of sports sciences can contribute to identifying the most appropriate organizational configuration tailored to the requirements of this unique and dynamic field. The comparative analysis of mechanistic and organic organizational structures, as defined by Burns and Stalker, holds significant importance, particularly given the rapidly evolving nature of the sports sciences field and its demand for interdisciplinary interactions. This field is influenced by rapid technological advancements, evolving sports policies, and innovative training methodologies.

This study was conducted to determine whether organizational structures in faculties of sports sciences are perceived as mechanistic or organic by academic staff. Due to the interdisciplinary nature and rapidly evolving environment of sports sciences, the impact of organizational structures on innovation, academic performance, and adaptability is critically important. Therefore, it is essential to identify and improve existing structures through this research. Previous literature suggests that organic structures promote innovation, collaboration, and flexibility, whereas mechanistic structures offer advantages in clear role definitions and task implementation. Studies in educational institutions emphasize that organic structures enhance participation and success, while mechanistic structures may reduce creativity and motivation.

The scientific rationale for this research is that organizational structures within faculties of sports sciences directly influence academics' working environments, innovative thinking capacity, and institutional adaptability to changing conditions. Findings from this study will contribute uniquely to sports management literature by providing scientific recommendations for adopting more innovative and flexible management models. Additionally, analyzing academics' perceptions of organizational structures will form a foundation for future research in this area. The significance of this study lies in highlighting the effects of organizational structures on academic productivity, creativity, and innovation within the dynamic context of sports sciences. Its innovative aspect is the comparative examination of mechanistic and organic structures specifically within the sports sciences context, offering a fresh perspective to the existing literature. Theoretically, it provides new insights into the impacts of these structures within sports sciences. Practically, it offers concrete recommendations for administrators aiming to enhance organizational effectiveness and improve academic working environments.

METHOD

Research Model

This research was designed in descriptive and relational survey model among quantitative research methods.

Research Groups

The study population consists of academic staff working in faculties of sports sciences across Turkey in 2024. The sample group includes 332 academic staff members selected for the study.

Data Collection Tools

Data were collected using the following tools:

A **Personal Information Form**, developed by the researchers, was used to gather demographic information about the participants.

The **Organizational Structure Scale—University Version**, adapted into Turkish by Erol and Ordu (2018), was used to assess the organizational structure of faculties of sports sciences. This scale consists of 27 items distributed across four dimensions: complexity, centralization, formalization, and stratification.

- The *complexity dimension* includes three subdimensions: functional specialization, professional training, and professional activities.
- The *centralization dimension* comprises two subdimensions: participation in decision-making and hierarchy of authority.
- The *formalization dimension* includes two subdimensions: standardization and professional dimension.
- The *stratification dimension* consists of two subdimensions: differences in rewards and differences in status.

Ethical Approval

The ethical compliance of this study was approved by the Sub-Ethics Committee of the Faculty of Sport Sciences, Atatürk University, with decision number 169, dated 25 October 2023.

Data Collection

The personal information form and scales used in the study were created as an e-survey using Google Forms. Subsequently, institutional email addresses of academics working in Facuties of Sport Sciences in Turkey were collected from the Türkiye Republic Counsil of Higher Education Academic Portal, and the survey link was sent to gather data. The data were collected in 2024.

Analysis of Data

- Demographic data of the participants were analyzed using **frequency analysis**.
- Descriptive statistics were applied to determine the mean scores obtained from the scales and subdimensions.

- The study sought to identify the organizational structure (mechanistic or organic) based on the components of organizational structure: complexity, centralization, formalization, and stratification. This determination was based on Burns and Stalker's (1961) organizational classification.

A measurement scale was developed that features 16 different models ranging from a fully mechanistic organization to a fully organic organization, based on variations in structural component scores (Erol & Ordu, 2018). On this scale, progression from model 1 to model 16 indicates a shift from mechanistic to organic organizational structure. These models were created based on literature insights. Pearson correlation analysis was conducted to determine the relationship between the overall average score of organizational structure and its subdimensions.

FINDINGS

Table 2. Demographic variables of the participants

		n	%
Gender	Male	224	67,5
	Female	108	32,5
Administrative Role	Yes	104	31,3
	No	228	68,7
Academik Title	Lecturer	33	9,9
	Research Assistant	43	13,0
	Assistant Professor	92	27,7
	Associate Professor	112	33,7
	Professor	52	15,7
Professional Seniority	Less than 1 year	47	14,2
	1-5 years	62	18,7
	6-10 years	76	22,9
	11-15 years	60	18,1
	16 years or more	87	26,1
Institutional Seniority	Less than 1 year	58	17,6
	1-5 years	97	29,2
	6-10 years	69	20,8
	11-15 years	46	13,8
	16 years or more	62	18,6
	Total	**332**	**100**

An analysis of the demographic characteristics of the participants showed that 224 individuals (67.5%) were male, while 108 (32.5%) were female. Regarding administrative roles, 104 participants (31.3%) held administrative positions, whereas 228 (68.7%) did not. In terms of academic titles, the lowest representation was among Lecturers (33 participants, 9.9%), while the highest representation was among Associate Professors (112 participants, 33.7%). For professional seniority, 47 participants (14.2%) had less than one year of experience, whereas 87 participants (26.1%) had 16 years or more. Regarding institutional seniority, the smallest group comprised those with 11–15 years of experience (46 participants, 13.8%), while the largest group consisted of those with 1–5 years of experience (97 participants, 29.2%).

Table 3. Participants' mean scores on the organizational structure scale and subdimensions

Scale and Dimensions	Subdimensions	n	Min.	Max.	Mean (X̄)	S.
Complexity	Number of Occupational Specialties	332	1,00	5,00	3,08	0,99
	Professional Training	332	1,00	5,00	3,48	0,87
	Professional Activities	332	1,00	5,00	3,09	0,91
	General	**332**	**1,67**	**4,78**	**3,21**	**0,70**
Centralization	Participation in Decisions	332	1,00	5,00	3,22	1,02
	Hierarchy of Authority	332	1,00	5,00	3,74	0,98
	General	**332**	**1,50**	**5,00**	**3,48**	**0,87**
Formalization	Standardization	332	1,00	5,00	3,71	1,02
	Professional Latitude	332	1,00	5,00	3,51	0,89
	General	**332**	**1,00**	**4,83**	**3,61**	**0,78**
Stratification	Difference in Rewards	332	1,33	5,00	3,49	0,85
	Difference between status	332	1,00	5,00	4,01	0,81
	General	**332**	**1,33**	**5,00**	**3,75**	**0,74**
Organizational Structure	General	**332**	**2,35**	**4,38**	**3,48**	**0,46**

An analysis of the participants' mean scores on the dimensions and subdimensions of the organizational structure scale reveals that the Complexity dimension had a general mean score of 3.21 (SD = 0.70), categorized as "moderate," while the Centralization dimension had a general mean score of 3.48 (SD = 0.87), also categorized as "moderate." The Formalization dimension had a general mean score of 3.61 (SD = 0.78), categorized as "high," and the Stratification dimension had a general mean score of 3.75 (SD = 0.74), also categorized as "high." The overall perception of Organizational Structure was determined to have a mean score of 3.48 (SD = 0.46), categorized as "high." These findings suggest that participants' perceptions of organizational structure align more closely with mechanistic organizational characteristics, emphasizing standardized processes, clear hierarchies, and formalized procedures.

Table 4. Mean scores of organizational structure dimensions based on participants' institutional tenure

	Complexity Score	Centralization Score	Formalization Score	Stratification Score
1. Group (Less than 1 year)	32 (+)	22 (+)	22 (+)	22 (+)
2. Group (1–5 years)	29 (+)	21 (+)	22 (+)	22 (+)
3. Group (6–10 years)	28 (+)	20 (+)	21 (+)	24 (+)
4. Group (11–15 years)	26 (+)	19 (+)	19 (+)	24 (+)
5. Group (16 years or more)	31 (+)	21 (+)	23 (+)	23 (+)

Complexity: $9 \leq$ Low/Reserved (-) $< 22.5 <$ High/Dominant (+) ≤ 45

Centralization, Formalization, Stratification: $6 \leq$ Low/Reserved (-) $< 15 <$ High/Dominant (+) ≤ 30

In the study, to determine whether the academic staff perceived the organizational structure of their faculty as closer to an organic or mechanistic structure, the mean scores of participants divided into five groups based on their institutional tenure were compared according to the scale value ranges. It was found that all dimensions were high (dominant+).

Table 5. Evaluation of participants' perception scores of their faculty's organizational structure based on institutional tenure

	Measurement Model															
Organizational Structure Component	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Complexity	-	+	-	-	+	+	-	-	+	-	-	+	+	+	+	-
Centralization	+	+	-	+	-	+	+	-	+	+	-	-	+	-	-	-
Formalization	+	+	+	-	+	+	+	-	-	-	+	-	-	+	-	-
Stratification	+	+	+	+	+	-	-	+	+	-	-	+	-	-	-	-
Mechanistic Organization	⟵															⟶ **Organic Organization**

An important finding derived from the scale is the determination of the organization's structure based on the high or low scores of organizational structure components—complexity, centralization, formalization, and stratification—using Burns and Stalker's (1961) organizational classification as a foundation. Based on different score combinations of these structural components, 16 different measurement models have been developed and arranged on a scale ranging from mechanistic to organic organization (Erol & Ordu, 2018). These 16 different models can be derived from the subdimension scores, enabling researchers to identify the approximate position of the institution being evaluated on the "mechanistic-organic organization scale" through the applied scale. In Hage's (1967) Axiology Theory, total scores can be obtained for each dimension: complexity, centralization, formalization, and stratification. Researchers classify scores below the midpoint as low/reserved (-) and those above the midpoint as high/dominant (+). This approach results in the emergence of 16 different ideal organizational structure types, or measurement models.

In light of this information, when Table 5 is examined, it is observed that all organizational structure scale dimensions for participants with different levels of institutional tenure have high/dominant (+) values. According to these results, the measurement model corresponds to the second column. Thus, it can be concluded that the organizational structure perceptions of academic staff with varying institutional tenure in faculties of sports sciences align with a mechanistic organizational structure.

Table 8. Relationships between organizational structure scale subdimensions and overall average

		Complexity	**Centralization**	**Formalization**	**Stratification**	**OS General Average**
Complexity	Pearson Corr.	1	,618**	,569**	-,306**	,853**
	p		< 0.001	< 0.001	< 0.001	< 0.001
	n	332	332	332	332	332
Centralization	Pearson Corr.	,618**	1	,597**	-,419**	,791**
	p	,000		< 0.001	< 0.001	< 0.001
	n	332	332	332	332	332
Formalization	Pearson Corr.	,569**	,597**	1	-,314**	,761**
	p	< 0.001	< 0.001		< 0.001	< 0.001
	n	332	332	332	332	332
Stratification	Pearson Corr.	-,306**	-,419**	-,314**	1	-,080
	p	< 0.001	< 0.001	< 0.001		,148
	n	332	332	332	332	332
OS General Average	Pearson Corr.	,853**	,791**	,761**	-,080	1
	p	< 0.001	< 0.001	< 0.001	,148	
	n	332	332	332	332	332

**; p<0.001

According to the table, a positive and moderate correlation was found between organizational structure (OS) complexity and centralization ($r = 0.618$, $p < 0.001$) as well as formalization ($r = 0.569$, $p < 0.001$), indicating that an increase in complexity is associated with an increase in centralization and formalization. Additionally, there is a negative and low-level correlation between complexity and stratification ($r = -0.306$, $p < 0.001$), showing that as complexity increases, stratification decreases. OS complexity also has a strong positive correlation with the overall average ($r = 0.853$, $p < 0.001$).

A moderate positive relationship was also found between OS centralization and formalization ($r = 0.597$, $p < 0.001$), suggesting that higher levels of centralization are associated with increased formalization. Centralization has a negative and moderate correlation with stratification ($r = -0.419$, $p < 0.001$), indicating that an increase in centralization corresponds to a decrease in stratification. OS centralization exhibits a very strong positive correlation with the overall average ($r = 0.791$, $p < 0.001$).

There is a negative and moderate correlation between OS formalization and stratification ($r = -0.314$, $p < 0.001$), meaning that as formalization increases, stratification decreases. Formalization also shows a strong positive correlation with the overall average ($r = 0.761$, $p < 0.001$), suggesting that a more formal structure positively influences the overall perception.

No significant correlation was found between OS stratification and the overall average ($r = -0.080$, $p = 0.148$), indicating that stratification does not have a significant impact on the general organizational perception. These findings suggest that most organizational structure components are positively correlated and have a significant impact on overall perception, while stratification appears to be influenced differently within this dynamic.

DISCUSSION AND CONCLUSION

This study aims to determine the perceptions of academic staff working in faculties of sports sciences regarding the organizational structure of their institutions. Additionally, the average scores obtained from the dimensions and subdimensions of organizational structure were also analyzed.

According to the results, the perceptions of academic staff regarding complexity and centralization were found to be at a “moderate” level, while their perceptions of formalization and stratification were at a “high” level. The overall perception of the organizational structure was also determined to be “high.” This indicates that academic staff perceive the tasks and decision-making processes as neither overly simple nor overly complex, but they feel that rules and hierarchies are quite rigid. While academic staff seem generally satisfied with the organizational structure, the high levels of formalization and stratification may have negative effects on creativity and academic freedom,

suggesting the need for careful attention. In this context, steps to increase organizational flexibility and encourage the participation of academics are recommended. The alignment of the subdimension and general averages at high levels suggests a perception of a mechanistic organizational structure. In other words, the higher the average scores, the more mechanistic the perceived structure.

A comparison was made based on institutional tenure to determine whether academic staff perceived the organizational structure as mechanistic or organic. The purpose of this test stems from the assumption that time spent in the institution provides more insight into perceptions of organizational structure. According to the analysis results in Table 4, it was observed that all tenure groups perceived their institutions as having a mechanistic organizational structure. Mechanistic organizational structures typically represent a centralized, hierarchical, rule-driven, and rigid management approach. These structures provide an environment where decision-making processes are standardized, and individual initiative is limited. The results reveal no significant difference in this perception based on tenure, indicating that the overall management style, culture, and functioning of the organization play a more decisive role than individual experiences.

The findings also suggest that perceiving institutions as having a mechanistic organizational structure could lead to some disadvantages for employees. Academic environments require flexible and organic structures that promote innovation, adaptation, and individual creativity. The rigidity of mechanistic structures could negatively affect employee satisfaction and motivation. Therefore, evolving organizational structures toward a more flexible, participatory, and collaborative model could be an important step in improving academic success and employee satisfaction.

When examining the research conducted on organizational structure, Hage and Aiken (1967) found that high levels of centralization and formalization in organizations were associated with increased alienation from tasks and relationships. On the other hand, Miskel (1979), in his study examining the relationship between perceived organizational effectiveness, organizational loyalty, job satisfaction, and organizational structure, found that schools perceived as more effective by teachers had more participatory organizational processes, less centralized decision-making structures, more formalized general rules, and more complex, highly specialized activities. Similarly, Jackson (2007b), in his study examining the relationship between shared decision-making perceptions of principals working in primary schools and the structural features of their schools (centralization, formalization, and complexity), found that principals perceived their schools as more formal and complex but less centralized. Schools where teachers participated in decision-making processes were perceived as less centralized, and schools where teachers wanted to participate in decision-making processes were perceived as more formal. He also found no significant relationship between centralized organizational structures and shared decision-making.

In other research on organizational structure, studies conducted in businesses have focused on measuring organizational structure characteristics (complexity, centralization, and formalization)

(Ambrose & Schminke, 2003; Hage & Aiken, 1967; Pheysey et al., 1971), while studies conducted in educational institutions have generally examined the bureaucratic structure of schools (Adams, 2003; Anderson, 2012; Beard et al., 2010; Brandy, 2008; George & Bishop, 1971; Gage, 2003; Guldan, 2004; Jackson, 2007a; Lennon, 2010; Mayerson, 2010; McGuigan, 2005; McGuigan & Hoy, 2006; McVey, 2009; Messick, 2012; Miskel, 1979; Okpogba, 2011; Rhoads, 2009; Sinden et al., 2004; Spinella, 2003; Sweetland, 2001; Volk, 2011; Watts, 2009; William, 1981).

Stinchcombe (1965) noted that formalization and specialization enhance performance in new ventures. Hage and Aiken (1967) reported that high centralization and formalization increase employee alienation. Mintzberg (1979) argued that organic structures are preferable in highly uncertain environments. Miskel (1979) found schools with participatory decision-making processes and lower centralization to be perceived as more effective by teachers. Meadows (1980) observed that organic structures increase job satisfaction, while Perrow (1986) identified structured roles as performance-enhancing.

Covin and Slevin (1988, 1989) emphasized that decentralized decision-making aligns with innovative strategies. Bourgeois et al. (1978) observed increased mechanistic structures under uncertainty due to control needs, and Cott (1997) found organic structures effective for problem-solving teams and mechanistic structures effective for implementation teams. Jogaratnam and Tse (2006) argued that organic structures might negatively impact performance in certain cultural contexts, whereas Jackson (2007b) indicated that schools with high teacher participation in decision-making processes are perceived as less centralized.

Ahrens and Chapman (2004) and Raisch (2008) suggested that a combination of mechanistic and organic elements can enhance performance. Sine et al. (2006) found that mechanistic structures are beneficial during the initial phases of new ventures. Dickson et al. (2006) indicated that organic structures foster diverse employee behaviors, and Skaggs and Galli-Debicella (2012), Müller and Martinsuo (2015) highlighted that organic structures improve customer service effectiveness and project performance. Csaszar (2012) reported decentralized structures as more error-resistant and accepting of projects.

Alavi et al. (2014) concluded that organic structures enhance workforce agility through decentralized decision-making, and Kessler et al. (2017) found that organic structures boost innovation and employee satisfaction. Wilden et al. (2013) demonstrated increased productivity under dynamic conditions within organic structures. In conclusion, to enhance academic freedom, creativity, and employee satisfaction, faculties should adopt more participatory and flexible management models. Reducing formalization and stratification could eliminate bureaucratic barriers, fostering innovation and creativity, and thus improving both academic performance and institutional satisfaction.

When examining the perceptions of academics working in faculties of sports sciences regarding organizational structure, a positive relationship was found between complexity and centralization

and formalization. This indicates that more complex structures require a more centralized and formal organizational design. A negative relationship was found between complexity and stratification, indicating that as complexity increases, hierarchical structures become flatter. Additionally, a strong positive relationship was found between organizational structure complexity and overall perception, showing that complex structures are perceived more positively.

A positive relationship was found between centralization and formalization, indicating that centralization increases formalization to ensure consistency. However, a negative relationship was found between centralization and stratification, suggesting that less hierarchical layers are preferred in more centralized structures. A strong positive relationship was found between centralization and overall perception, indicating that centralization contributes to efficiency and clarity.

A negative relationship was identified between formalization and stratification, indicating that formalization flattens hierarchies. Formal structures positively influenced overall perception, likely due to clear rules and standards reducing uncertainty and improving organizational perception. On the other hand, no significant relationship was found between stratification and overall perception, suggesting that hierarchical structures do not directly affect employees' perceptions.

In conclusion, while complexity, centralization, and formalization were found to positively influence overall perceptions of organizational structure, stratification appeared to function differently within these dynamics. This study revealed that academic staff working in Faculties of Sport Sciences in Turkey predominantly perceive their institutions as having mechanistic organizational characteristics. High levels of centralization, formalization, and stratification indicate the dominance of hierarchical systems, rule-based procedures, and limited participation in decision-making processes. Although such structures may ensure a certain level of order and control, they can be restrictive in dynamic and interdisciplinary fields such as sport sciences, where innovation, flexibility, and academic productivity are essential. The findings suggest that a transition toward more organic organizational models—emphasizing participative decision-making, horizontal communication, and decentralization—could significantly enhance both academic satisfaction and institutional agility. Therefore, it is recommended that current organizational structures in sport sciences faculties be critically re-evaluated to foster a more innovative, adaptive, and sustainable academic governance approach.

Based on the results, some suggestions can be made to increase organizational flexibility and promote academic freedom. Faculties can adopt more participatory and flexible management models to allow academic staff greater involvement in decision-making processes. Additionally, by reducing formalization and stratification levels, faculties can remove bureaucratic barriers to innovative and creative work. These changes could increase job satisfaction among academic staff and strengthen organizational commitment. Through such structural changes, faculties could enhance both academic performance and institutional satisfaction.

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REFERENCES

Adams, C. M. (2003). *The effects of school structure and trust on collective teacher efficacy*. (Doctoral dissertation). Oklahoma State University.

Agbim, K. C. (2013). The impact of organizational structure and leadership styles on innovation. *IOSR Journal of Business and Management*, *6*(6), 56-63. https://doi.org/10.9790/487X-0665663

Ahrens, T., & Chapman, C. S. (2004). Accounting for flexibility and efficiency: A field study of management control systems in a restaurant chain. *Contemporary Accounting Research, 21*(2), 271–301. https://doi.org/10.1506/VJR6-RP75-7GUX-XH0X

Aksay, K. (2015). Örgüt yapılarında yaşanan değişimler ve modern örgüt tiplerinin incelenmesi. *Kent Akademisi*, *8*(3),111-128.

Alanoğlu, M., & Demirtaş, Z. (2020). Bürokratik okul yapısı ile müdür yönetim tarzları arasındaki ilişkilerin incelenmesi. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi, 48*, 199-213. https://doi.org/10.9779/pauefd.560610

Alavi, S., Abd. Wahab, D., Muhamad, N., & Arbab Shirani, B. (2014). Organic structure and organisational learning as the main antecedents of workforce agility. *International Journal of Production Research*, *52*(21), 6273-6295. https://doi.org/10.1080/00207543.2014.919420

Altunay, Ö. (2006). *Örgüt yapısındaki değişimlerin örgüt kültürü üzerindeki etkilerinin belirlenmesine yönelik bir araştırma*. (Yüksek lisans tezi), Dumlupınar Üniversitesi, Sosyal Bilimler Enstitüsü, Kütahya.

Ambrose, M. L., & Schminke, M. (2003). Organization structure as a moderator of the relationship between procedural justice, interactional justice, perceived organizational support, and supervisory trust. *Journal of Applied Psychology, 88*(2), 295–305. https://doi.org/10.1037/0021-9010.88.2.295

Anderson, K. (2012). *Examining relationships between enabling structures, academic optimism, and student achievement* (Unpublished doctoral dissertation). Auburn University.

Beard, K. S., Hoy, W. K., & Hoy, A. W. (2010). Academic optimism of individual teachers: Confirming a new construct. *Teaching and Teacher Education*, *26*(5), 1136-1144. https://doi.org/10.1016/j.tate.2010.02.003

Bourgeois, L. J., McAllister, D. W., & Mitchell, T. R. (1978). The effects of different organizational environments upon decisions about organizational structure. *Academy of Management Journal, 21*(3), 508–514. https://doi.org/10.5465/255732

Bozkuş, K. (2016). Örgüt yapısı ve okullar. *Kesit Akademi Dergisi*, *2*(4), 236-260.

Brandy, D. A. (2008). *The effect of school organizational structure on professional development transfer of training* (Doctoral dissertation). Oakland University.

Burns, T., & Stalker, G. M. (1968). *The management of innovation*. Associated Book Publishers. https://doi.org/10.1093/acprof:oso/9780198288787.001.0001

Covin, J. G., & Slevin, D. P. (1988). The influence of organization structure on the utility of an entrepreneurial top management style. *Journal of Management Studies, 25*(3), 217–234. https://doi.org/10.1111/j.1467-6486.1988.tb00033.x

Csaszar, F. A. (2012). Organizational structure as a determinant of performance: Evidence from mutual funds. *Strategic Management Journal, 33*(6), 611–632. https://doi.org/10.1002/smj.1969

Daft, R. L., Murphy, J., & Willmott, H. (2010). *Organization theory and design*. Nelson Education Ltd.

Dickson, M. W., Resick, C. J., & Hanges, P. J. (2006). Systematic variation in organizationally-shared cognitive prototypes of effective leadership based on organizational form. *The Leadership Quarterly, 17*(5), 487–505. https://doi.org/10.1016/j.leaqua.2006.07.005

Erol, E., & Ordu, A. (2018). Organizational structure scale–University version. *European Journal of Educational Research, 7*(4), 775-803. https://doi.org/10.12973/eu-jer.7.4.775

Gage III, C. Q. (2003). *The meaning and measure of school mindfulness: An exploratory analysis*. The Ohio State University.

George, J. R., & Bishop, L. K. (1971). Relationship of organizational structure and teacher personality characteristics to organizational climate. *Administrative Science Quarterly*, *16*(4), 467–475. https://doi.org/10.2307/2391766

Guldan, E. A. (2004). *Enabling bureaucracy, faculty trust, and collective efficacy in selected catholic elementary schools*. St. John's University (New York).

Hage, J., & Aiken, M. (1967). Relationship of centralization to other structural properties. *Administrative Science Quarterly, 12*(1), 72–92. https://doi.org/10.2307/2391213

Hoy, W. K., & Miskel, C. G. (2015). *Eğitim yönetimi: Teori, araştırma ve uygulama* (S. Turan, Çev.). Nobel Yayın Dağıtım.

İçerli, L. (2009). *Örgüt yapısı ve örgütsel adalet arasındaki ilişkiler* (Yayınlanmamış doktora tezi). Dokuz Eylül Üniversitesi, Sosyal Bilimler Enstitüsü, İzmir.

Jackson, C. K. (2007a). A little now for a lot later: A look at a Texas Advanced Placement incentive program. *Journal of Human Resources, 42*(3), 591–639. https://doi.org/10.3368/jhr.45.3.591

Jackson, J. M. (2007b). *An examination of the relationship between elementary school principals' perceptions of shared decision making and three organizational structures* (Doctoral dissertation). Wayne State University.

Jogaratnam, G., & Tse, E. C. Y. (2006). Entrepreneurial orientation and the structuring of organizations: Performance evidence from the Asian hotel industry. *International Journal of Contemporary Hospitality Management, 18*(6), 454–468. https://doi.org/10.1108/09596110610681502

Kessler, S. R., Nixon, A. E., & Nord, W. R. (2017). Examining organic and mechanistic structures: Do we know as much as we thought? *International Journal of Management Reviews, 19*(4), 531–555. https://doi.org/10.1111/ijmr.12109

Koçel, T. (2018). *İşletme yöneticiliği* (17. baskı). Beta Yayıncılık.

Lennon, P. A. (2010). *The Relationship of bureaucratic structure to school climate: An exploratory factor Analysis of Construct Validity*. ProQuest LLC. 789 East Eisenhower Parkway, PO Box 1346, Ann Arbor, MI 48106.

Lunenburg, F. C., & Ornstein, O. C. (2013). *Eğitim yönetimi* (G. Arastaman, Çev.). Nobel Yayıncılık.

Mayerson, D. (2010). *The relationship between school climate, trust, enabling structures, and perceived school effectiveness* (Unpublished doctoral dissertation). St. John's University.

McGuigan, L. (2005). *The role of enabling bureaucracy and academic optimism in academic achievement growth* (Unpublished doctoral dissertation). The Ohio State University, Columbus, Ohio.

McGuigan, L., & Hoy, W. K. (2006). Principal leadership: Creating a culture of academic optimism to improve achievement for all students. *Leadership and Policy in Schools, 5*(3), 203-229. https://doi.org/10.1080/15700760600805816

McVey, D. (2009). *Parsonian influence and the effect of school climate and bureaucracy on the perceived effectiveness in schools* (Unpublished doctoral dissertation). St. John's University, Jamaica, New York.

Mintzberg, H. (1979). *The structuring of organizations: A synthesis of the research*. Prentice-Hall.

Mintzberg, H. (1993). *Structure in fives: Designing effective organization.* Prentice-Hall, International Editions.

Mintzberg, H. (2015). *Örgütler ve yapıları* (A. Aypay, Çev. Ed.). Nobel Yayıncılık.

Miskel, C. (1979). *Demographic characteristics, faculty attitudes, and school structure*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA, United States, April 8–12.

Miskel, C. G. (1979). Organizational structures for schools. *Educational Administration Quarterly, 15*(3), 97–118.

Okpogba, D. (2011). *Organizational structure, collegial trust, and college faculty teaching efficacy: A case study* (Unpublished doctoral dissertation). Oklahoma State University, Oklahoma.

Özcan, E. D. (2010). *Algılanan örgüt yapısı ile iş tatmini arasındaki ilişkide kişilik özelliklerinin rolü ve bir araştırma* (Yayınlanmamış doktora tezi). Marmara Üniversitesi, İstanbul.

Pheysey, D. C., Payne, R. L. & Pugh, D. S. (1971). Influence of structure at organizational and group levels. *Administrative Science Quarterly, 16*(1), 61-73. https://doi.org/10.2307/2391289

Rhoads, D. (2009). *Enabling structure and collective efficacy: A study of teacher perceptions in elementary divisions of American schools in Mexico* (Unpublished doctoral dissertation). Seton Hall University, New Jersey.

Robbins, S. P., & Judge, T. A. (2013). *Örgütsel davranışın temelleri* (İ. Erdem, Çev.). Nobel Yayıncılık.

Robbins, S. P., & Judge, T. A. (2017). *Örgütsel davranışın temelleri* (İ. Erdem, Çev.). Nobel Yayın Dağıtım.

Sinden, J. E., Hoy, W. K., & Sweetland, S. R. (2004). An analysis of enabling school structure: Theoretical, empirical, and research considerations. *Journal of Educational Administration*, *42*(4), 462-478. https://doi.org/10.1108/09578230410544071

Sine, W. D., Mitsuhashi, H., & Kirsch, D. A. (2006). Revisiting Burns and Stalker: Formal structure and new venture performance. *Academy of Management Journal*, *49*(1), 121-132. https://doi.org/10.5465/amj.2006.20785590

Spinella, F. A. (2003). *The principal's role in new teacher retention* (Unpublished doctoral dissertation). University of New Orleans, New Orleans, LA.

Stinchcombe, A. L. (1965). Social structure and organizations. In J. G. March (Ed.), *Handbook of organizations* (pp. 142–193). Rand McNally.

Sweetland, H. (2001). Authenticity and sense of power in enabling school structures: An empirical analysis. *Education, 121*(3), 581-588.

Volk, A. (2011). Teachers' experiences with bureaucracy in loosely and tightly coupled systems: Impacts on professional practice. In *12th Annual University of Manitoba Education Graduate Student Symposium: Sharing Our Research* (March 4–5). University of Manitoba, Winnipeg, Canada.

Watts, D. (2009). *Enabling school structure, mindfulness, and teacher empowerment: Test of a memory* (Unpublished doctoral dissertation). The University of Alabama, United States.

Weber, M. (1947). *The theory of social and economic organization*. Oxford University Press.

Wilden, R., Gudergan, S. P., Nielsen, B. B., & Lings, I. (2013). Dynamic capabilities and performance: Strategy, structure, and environment. *Long Range Planning, 46*(1-2), 72–96. https://doi.org/10.1016/j.lrp.2012.12.001

Yıldırım, K. (2014). Mekanik-organik örgütsel yapı değişkenleri perspektifiyle 6528 sayılı kanunun okulların örgütsel yapısında yaratabileceği değişimin incelenmesi. *Kuram ve Uygulamada Eğitim Yönetimi*, *20*(3), 359-391.