EXPLORING THE ASSOCIATION BETWEEN SMARTPHONE USE AND RELATED MENTAL WELL-BEING FACTORS: PERSPECTIVES FROM THE HIGHEST LEVEL OF FOOTBALL AND FUTSAL PLAYERS IN FINLAND

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ABSTRACT

Čulák Ivan, 2023. Exploring the association between smartphone use and related mental well-being factors: Perspectives from the highest level of football and futsal players in Finland, Psychology of Physical Activity, Health, and Well-being, Faculty of Sport and Health Sciences, University of Jyväskylä, Master's thesis, 52 pages.

Smartphones have become widespread in contemporary society, including athletes who rely on them for various purposes. However, the potential negative effects of smartphone use on the mental well-being and performance of athletes require investigation. The aims of this study were to investigate athletes' own perceptions of smartphone use, explore potential differences in smartphone dependence and negative effects between professional and non-professional football/futsal players, examine smartphone use patterns during training days, and identify key predictors of continued smartphone use despite knowledge of potential negative consequences among high-level football/futsal players.

A quantitative approach was employed using an online questionnaire to assess athletes' perceptions of smartphone use in this study. The study included participants who were athletes competing at the top three tiers of football in Finland, as well as participants from the highest futsal league. The sample encompassed both male and female players.

The findings indicate that smartphone dependence and its negative effects are present among football/futsal players, irrespective of their playing level or professional status. Furthermore, the study showed that age was a significant predictor of smartphone usage. Specifically, with each additional year of age, the participants reported an increase in their intention to use their smartphones, on average, by 0.55 times per day, while controlling for other factors ($\beta = 0.55$, $p < .001$). These results highlight the importance of accounting for age differences when designing interventions aimed at promoting healthy phone use habits among athletes. The implications of these findings for the development of interventions aimed at fostering healthy phone use habits among athletes should be carefully considered.

Keywords: Smartphone; Football, Futsal, Excessive Smartphone Use

TIIVISTELMÄ

Čulák Ivan, 2023. Tutkimassa älypuhelinten käytön sekä siihen liittyvien mielenterveystekijöiden välistä suhdetta: Näkökulmia Suomen korkeimman tason jalkapallo- sekä futsalpelaajilta, Psychology of Physical Activity, Health, and Well-being, Faculty of Sport and Health Sciences, Jyväskylän yliopisto, opinnäytetyö, 52 sivua.

Nyky-yhteiskunnassa älypuhelinten käyttö on levinnyt laajalle, mukaan lukien niitä monissa käyttötarkoituksissa hyödyntävien urheilijoiden keskuuteen. Älypuhelinten käytön mahdolliset negatiiviset vaikutukset urheilijoiden mielenterveyteen sekä suoritukseen vaativat kuitenkin tutkimista. Täten, tämän tutkimuksen tavoitteena oli tutkia urheilijoiden omia näkemyksiä älypuhelinten käytöstä, kartoittaa ammatti- sekä harrastetason jalkapallo- ja futsalpelaajien keskuudessa mahdollisesti ilmenevää älypuhelinriippuvuutta sekä muita mahdollisia negatiivisia vaikutuksia, tarkastella älypuhelinten käyttöön harjoittelupäivinä liittyviä kaavoja sekä tunnistaa keskeisiä syitä älypuhelimen käytön jatkamiselle mahdollisten negatiivisten seurausten tiedostamisesta huolimatta korkean tason jalkapallo- ja futsalpelaajien keskuudessa.

Tutkimuksessa sovellettiin kvantitatiivista tutkimusmenetelmää toteuttamalla verkkokysely, jonka avulla arvioitiin urheilijoiden havaintoja älypuhelimen käytöstä. Tutkimukseen osallistui Suomen kolmella korkeimmalla tasolla kilpailevia jalkapalloilijoita sekä futsalin korkeimmalla tasolla kilpailevia urheilijoita. Tutkimuksen otanta kattoi sekä mies- että naispuolisia pelaajia.

Tutkimuksen tulokset viittaavat älypuhelinriippuvuuden sekä muiden älypuhelinten käytön negatiivisten vaikutusten läsnäoloon jalkapallo- sekä futsalpelaajien keskuudessa huolimatta heidän mahdollisesta ammattistatuksestaan tai tasosta, jolla he pelaavat. Tämän lisäksi tutkimus osoittaa iän olevan merkityksellinen tekijä älypuhelimen käytön lisääntymisessä, sillä jokaisen uuden ikävuoden myötä osallistujat raportoivat heidän aikeensa käyttää puhelintaan lisääntyvän keskimäärin 0.55 kertaisesti päivässä. Muilla tutkimuksessa huomioon otetuilla tekijöillä kuin vastaajan iällä ja omilla aikeilla ei löydetty olevan huomattavaa merkitystä ($\beta = 0.55$, $p < .001$). Tutkimuksen tulokset korostavat ikäerojen huomioimisen tärkeyttä suunniteltaessa älypuhelinten terveelliseen käyttöön liittyviä väliintuloja urheilijoille, ja tutkimuksen löydökset tulisi ottaa huomioon kyseisten väliintulojen kehittämisessä.

Avainsanat: älypuhelin, jalkapallo, futsal, liiallinen älypuhelimen käyttö

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1 INTRODUCTION

Use and exposure to electronic devices have been increasingly a matter of important interest in a wide range of scientific fields. Advancements in technology have generated a pressing demand for an in-depth scientific understanding of the usage of smartphones in diverse contexts, across varying age groups and nations, and inevitably in the world of elite sports. However, much uncertainty still exists about athletes' own perception of their smartphone use. While previous studies have provided insight into how athletes use their phones, these studies do not necessarily capture the full extent of athletes' subjective experiences with their electronic devices (Durand-Bush & DesClouds 2018; Gezgin & Mihci 2020). It is hoped that this research will contribute to a deeper understanding of athletes own perception, awareness, and current behaviour regarding smartphone use, as well as provide some practical applications for athletes, coaches or other practitioners in the field. It is important to investigate the disparities between professional and amateur athletes, given their unique training regimes, schedules, and pressures, as these factors may have different impacts on their smartphone usage behaviors and associated outcomes.

A large proportion of the population in Finland is regularly exposed to a variety of electronic screens on a daily basis, which includes the display screen of smartphones (Pandya & Lodha, 2021). Smartphones are undoubtedly a necessary part of everyday life of adults across the world, especially in western societies. Over the past decade, the usage of mobile internet devices has witnessed an exponential increase, becoming an integral part of daily routine (Qui et al., 2021). The ownership of a smartphone among adults in Finland is nothing unusual. Naturally, athletes, currently playing at the highest level of the club system of football or futsal in Finland are no exception. Nowadays, in the age of the unquestionable popularity and widespread use of social media we are able to see professional athletes in

many different ways or settings, not just on the field during the matches but also outside of the competition environments in different settings. For the time being, it is not uncommon for professional athletes to share or post from their homes, and about their life outside of the stadiums in general on their social media repeatedly a number of times during every day.

The aim of this thesis was to explore athletes' own perception of their smartphone use in the elite sport environment in Finland, more specifically on the highest levels of football and futsal. Although football and futsal are both categorized as team sports and invasion games (opposing teams engage in territorial invasions to create better scoring opportunities) (Spittle 2021), and these two sports share many similarities in movement patterns, their physiological demands differ due to varying factors such as playing surface, number of players, game duration, substitutions, and specific rules (Leite, 2016).

The issue and possible consequences of inadequate use or smartphone-related behavior among athletes has not received an adequate amount of attention in the sports settings and there is a considerable deficient amount of scientific research carried out in English language from Finnish futsal and football environment. Further research in this area is necessary to develop a comprehensive understanding of the extent to which smartphones are used by athletes, how they are used, and what impact their use has on athlete performance and well-being. This study uses a quantitative data approach to address this matter. The limitations of the study are outlined in the discussion section.

1.1 Football in Finland

Finland is a country located in the northern part of Europe, with a number of considerable challenges for playing football, for instance, the climate (Szerovay, 2018). Winters in Finland are longer and colder than in the rest of the football Europe, therefore naturally changing people’s attention towards winter sports, in which Finland has

experienced much greater success, particularly in ice hockey (Itkonen & Nevala, 2012). Due to these climate and geographical disadvantages, unlike in the majority of European league systems, a football season in Finland is completed within a single calendar year. Although football is the most played team sport in Finland registered participants-wise, it has been previously indicated that this was not transformed into an evident growth in attendance (Itkonen & Nevala, 2007). Participation in women's football has been rising in Finland. In 1990, the number of women actively playing football in Finland was approximately 5000 (Tuunainen, 2007), According to Palloliitto's report in 2020, the current number of girls playing football in Finland has increased to 33,000 (Hakala, 2020). The considerable growth in the number of participants in women's football in Finland in recent years is an encouraging development.

Nevertheless, Finland's men's national team had only recently experienced their first international success, more precisely, participation in the European football championship 2020 for the first time in history, also grabbing their first final tournament win (against Denmark 1:0, 12/06/2021). Women's national football team of Finland has achieved far more international success, qualifying 4 times for European football championship (2005; 2009; 2013; 2022). As per the FIFA country ranking, the current position of the Finnish men's team is 56th, while the women's national football team of Finland is ranked much higher, at 29th position (FIFA, 2023).

The focus of this research encompasses several football leagues in Finland, including the Kansallinen Liiga, which is the national league for women's football in Finland, previously known as the women's Finnish championship. The highest level of men's football in Finland is the Veikkausliiga, named after its primary sponsor, Veikkaus Oy, a government-owned betting organization that has held naming rights to the league since 1992 (Töllikkö, 2020). Additionally, the study also includes men's Ykkonen and Kakkonen, as

well as women's Ykonnen, which share a common professional contract for players. By including these diverse leagues, this research aims to capture a broad selection of players in top levels of Finnish football and provide a more comprehensive understanding of smartphone use in the sport at both professional and amateur levels. The behavior of professional and amateur athletes may differ in their daily routines and smartphone use. Professional athletes often follow structured schedules centered around training and competition, while amateur athletes have less focus on their sport routines due to other commitments, such as work, studies, or family. It is important to note that amateur players, meaning those for whom playing football is not their primary source of income and who work or study as their main occupation, typically participate in the sport without financial compensation or at most to cover their travel expenses.

1.2 Futsal in Finland

Futsal is considered an invasion sport and holds a significant position among team sports commonly played in school settings (da Cunha Voser et al., 2018). Futsal as a game can be described as an adaptation of football, played indoors in a hard surface pitch measuring 40 × 20 m, using smaller goals 3 × 2 m (same as in handball). There are 4 in-field players and one goalkeeper in each team, with an unlimited amount of substitutions during the game, during two regressive stop-watched periods of 20 min (Doğramaci et al., 2015). Futsal is an indoor adaptation of football and is currently governed by the same organization as football, FIFA (Fédération Internationale de Football Association).

In this research, there are included data from the highest level of futsal in Finland as well, which are Miesten Futsal-liiga (the highest men's league in futsal) and Naisten Futsal-liiga (the highest women's league in futsal). In contrast to football in Finland, the season for futsal adheres to the autumn-spring league calendar. This scheduling of the futsal season

calendar ensures minimal or no overlaps with football matches, particularly during winter periods. This arrangement allows spectators to easily shift their attention and engagement towards futsal as an alternative sport during those times. opportunity for spectators etc.. Futsal is recognized as an official sport in Finland and is governed by the Finnish Football Association (Suomen Palloliitto). At this time, in the European-scale comparison, Finland's men's national futsal team stands in the 12th position in the UEFA Futsal national team rankings. There was no official updated ranking system available for women's futsal national teams at the time being. To better picture the current position of Finland's women's futsal team, we used the Women's association club coefficients, where Finland is currently ranked 30th among women's association football clubs. Finland´s men national futsal team achieved a notable achievement, successfully advancing through the early rounds of the tournament and ultimately finished among the top 8 teams in the EURO 2022. Football and futsal share many similarities in terms of tactical and technical skills, physical, psychological demands, and physiological responses. These similarities make it reasonable to research them together, which may provide valuable insights into the development and optimization of training programs for both sports regarding smartphone use and related practices.

From an academic point of view, it is often perceived that there is a lack of research in futsal in the English language, especially when we take in account the enormous amount of literature available in the field of sport science in general, particularly in football (Moore et al., 2014). Therefore, this research aims to expand scientific knowledge in this sport from a different perspective and contribute with scientific information from the top-level of Finnish futsal.

1.3 Mental health in elite sport environment

The intense mental and physical demands placed on elite athletes are a unique feature of the elite sport environment, and these may increase their vulnerability to specific mental health issues, or unhealthy risk-taking behaviours (Hughes & Leavey, 2012). The existing literature has repeatedly found physical activity as a protective factor for mental health, however, it has been demonstrated by a review that intensive physical activity performed at the elite sports competition level may deteriorate mental wellbeing, growing the symptoms of anxiety and depression through overtraining, injury, or burnout (Peluso et al. 2005). Adverse life or sport-specific circumstances, such as serious physical injuries and surgeries requiring extended recovery periods, are associated with the development of mental health issues, as stated by Arnold and Fletcher in 2012. A significant claim and discussion was presented by Åkesdotter et al. (2020) about elite athletes experiencing mental health problems. Their presented evidence shows that 50% of elite level competitors experience mental health problems at some point during their career. This finding highlights the importance of mental health support for athletes, particularly those competing at the elite level, and the need for further research in this area to better understand and address the factors contributing to mental health challenges among athletes .It is worth noting that the prevalence of mental health problems among athletes may vary depending on the level of sport and the demands of the particular sport.

It has also been shown in this research, that recurrent episodes are common. According to a study conducted by Schaal et al. (2011) which involved over 2000 young and adult French Olympic athletes, 17% of the participants reported experiencing mental health issues in the past.

In the context of athletic and non-athletic transitions, having satisfying mental well-being is a valuable asset for athletes as it can help in effective decision-making and successful coping skills, whereas inadequate mental health state can influence these processes negatively (Schinke et al., 2017). Therefore, prioritizing and addressing mental health concerns in athletes can help them navigate these challenges more successfully and lead to a more fulfilling career both on and off the field.

According to Gulliver et al. (2012), the most notable observation from their study was the significant influence of stigma in preventing athletes from seeking help for mental health issues. This suggests that stigma reduction efforts are necessary to increase the likelihood that athletes will seek and receive the mental health support they need. Many athletes may feel that seeking help for mental health issues is a sign of weakness or that it may harm their career prospects. As a result, they may suffer in silence, which can intensify their mental health problems and potentially lead to long-term consequences.

2 SMARTPHONE

It is very important to consider the relationships between the general smartphone use among adults, mental health, and elite level of sport, as these factors can interact and influence one another. Moreover, investigating the potential moderating factors, such as gender, age, and level of competition, could offer a different perspective on the complex relationship between the factors included in this matter.

2.1 Definitions

Electronic screens and smartphones are part of our everyday life now. Briefly described, the smartphone is a portable communication device with a high variety of functions. Since the release of the Apple iPhone on the market, the number of smartphone owners has progressively increased all over the world. The availability of smartphones across the world has been a significant contributory factor to the increased smartphone use and screen time exposure among all age categories in the world. Smartphones commonly have touch screens, access to the internet network (Wi-Fi or cellular data). The user is given an opportunity to download a wide range of various smartphone applications, and use other functions such as media players, notebooks, calendars, weather forecasts, digital cameras, and GPS-based navigation (Haug et al., 2015). According to the definition used by Hooi Ting et al. (2011), a smartphone is a mobile phone that is capable of running programs and applications, providing individuals with advanced functionalities and features that are useful in both their personal and professional lives.

A detailed classification of the reasons that make smartphone ownership and use pleasant was listed by Carbonell et al. (2013). It includes experiencing a sense of euphoria, the smartphone being a symbol of identity, and social status, or online social networking, increased feeling of security, source of entertainment, or just simply being updated and

online (Carbonell et al., 2013). The effortlessness of carrying a smartphone allowed it to become the preferred device for accessing the internet, media and other telecommunication services, social networks and many other very well-known features (Loleska & Pop-Jordanova, 2021).

According to Olson et al. (2016), screen time can be defined as follows: “screen time is time spent using an electronic screen, such as a television, computer, or mobile device”. However, it should be noted that different studies may use slightly different definitions of screen time, which could lead to variation in the results and make comparisons across studies more difficult. It is also important to understand the difference between screen time and smartphone use for this research.

Online Cambridge English Dictonary briefly describes the term social media as: websites and computer programs that allow people to communicate and share information on the internet using a computer or mobile phone. There is no doubt that social platforms, such as Instagram, Facebook, Snapchat, TikTok, or Twitter have experienced remarkable growth in recent years. Another definitions mentioned online social platforms can be “a group of Internet-based applications, and that allow the creation and exchange of user-generated content” (Kaplan et al., 2010).

Based on the commonly accepted definitions in the field, the definitions provided appear to be scientifically valid and appropriate for use in this thesis examining smartphone use perceptions and phenomenon related to it.

2.2 Smartphone use

Smartphones are the most used technology internationally. Considering the immense number of functions available within every smartphone, it has become an essential information and communication tool of daily life (Körmendi et al., 2016).

Based on scientific research, the use of smartphones has been found to have an impact on various aspects of daily lives, and its everyday use having possible negative effects on many areas of life. In a large sample study by Rotondi et al. (2017), results showed that the use of the smartphone negatively affects the quality of time spent with significant others, for instance with friends. Furthermore, this study suggested also that level of satisfaction with friends is also less strong for individuals who use smartphones.

Nevertheless, advances in technology can hinder scientific efforts. As a matter of fact, by the time scientific research evaluates impact of technology use, the technology may have already changed, as well as behaviour while using it. A good illustration of this case is the scientific research about social media, which focused previously on social platforms such as Facebook, Twitter, or Instagram. However, currently we are experiencing enormous popularity of other social platforms, such as TikTok. In a similar case LeBlanc et al. (2017) identified that most screen time self-report questionnaires focus primarily on television and computer time, as opposed to the smartphones and tablets that make up an increasingly large proportion of screen time.

In this study, we use the term smartphone dependence. Dependence refers to a physical state in which the body adapts to the presence of a substance, resulting in tolerance and withdrawal symptoms (Park, 2019). It is important to note that dependence is distinct from addiction and can exist without harmful consequences. Similarly, smartphone dependence can manifest differently among individuals, with some experiencing anxiety or depression, while others find relaxation, joy, or gratitude in their smartphone use (Choi et al., 2015; Lemola et al., 2015).

In conclusion, smartphone use can be affected by a number of different factors, including age, gender, socioeconomic status, and cultural background. This can make it

difficult to generalize about patterns of smartphone use across different populations. Literature review of existing scientific data leads us to the conclusion that evaluating the average daily smartphone use among adults may be challenging due to a number of factors and limitations, such as inconsistent findings and numerous determinants that can impact smartphone use. Based on the available research, there is a significant diversity in the amount to which adults use smartphones on a daily basis. While some individuals may rely heavily on their devices for communication and entertainment, others may utilize them primarily for work or academic purposes. Therefore, it may not be appropriate to conclude with a single number or percentage representing typical daily smartphone use for adults.

2.3 Athlete's smartphone use

In this chapter, several important scientific findings and data will be introduced regarding athletes' smartphone use, screen time, and social media behavior. The information included is from a number of different sports and countries, mainly due to a lack of more specific research in this topic, as well as lack of available research conducted in Finland about athletes' smartphone use. Whilst investigating this issue, it is important to mention that the smartphone and social media field is constantly changing. For instance, Bauer et al. (2020) argued that the changes, and constant technological developments in smartphones are happening so rapidly, that it is very difficult to provide an updated overview of the health consequences for regular users.

In 2017, Encel et al. (2017) reported in a study focused on university athletes that 68.1% of the athletes accessed their Facebook account 2 hours before their sport competition and 31% used Facebook during competitions. These results should be important for coaches and sport psychology practitioners because social media and smartphone use shortly before competing may act as a distraction from optimal psychological preparation and focus.

In a more recent study by DesClouds et al. (2021), athletes perceived their smartphones to be an origin of distress both when their smartphone was available and unavailable to them. Smartphone separation anxiety may possibly hinder optimal psychological performance state. In the context of athletic performance, smartphone separation anxiety may hinder an athlete's ability to achieve an optimal psychological performance state. It is important to address smartphone separation anxiety and provide athletes with strategies to manage their smartphone use and cope with the anxiety that may arise from smartphone separation. Cheever et al., 2014 highlighted a number of negative effects of such behavior, such as increased anxiety and arousal, particularly within the group of individuals who heavily rely on their smartphones and have developed a dependency on their phones.

Use of social media by the elite-level athletes may unfortunately lead to negative experiences as well. MacPherson & Kerr (2021), mentioned that previous scientific research in this area has revealed a number of possible negative experiences, such as critical, belittling, and aggressive comments of a sexual, psychological, physical, discriminatory, or personal essence towards athletes by fans in online space. Although it may not be a significant concern for amateur players, raising awareness regarding the use of smartphones and social media should be included at all levels.

To optimize athletic performance and promote mental health among athletes, monitoring their smartphone usage is a useful strategy that coaches and athletes should consider incorporating into their training and daily routines (Durand-Bush & DesClouds, 2018).

2.4 Smartphone use and mental health

Excessive exposure to electronic screens and smartphones has been shown to be related to a number of negative effects. In comparison to personal, face-to-face social networks, which are linked with a number of positive outcomes, such as life satisfaction and mental well-being, the use of a social platform to connect with others, has been found to negatively oppose these benefits, diminishing overall mental health (Neophytou et al., 2021). There is an unambiguous relationship between the excessive use of smartphone and the number of negative mental health and psychological consequences, on which we will focus in this thesis. Immoderate use may weaken social interaction skills, onset real-life relationship issues among people that have higher use of smartphone daily (Kuss & Griffiths, 2011).

The relationship between excessive smartphone use and mental health problems has been an area of concern in the literature. Augner and Hacker (2012) found significant associations between smartphone use, chronic stress, and depression in young women. They reported that higher levels of smartphone use were associated with higher levels of negative distress and depression, particularly among those who used their smartphones for social purposes. The authors suggested that these findings may be related to the constant availability and accessibility of social media and other online platforms, which can lead to feelings of pressure to respond immediately and maintain a certain image or persona online. These findings highlight the importance of considering the potential negative impacts of excessive smartphone use on mental health, particularly among young women.

Elhai et al. (2017) discovered that depression severity was related to social smartphone use. Another research identified that participants with greater level of depression engaged in less social-related smartphone use (e.g. social interaction, posting online more regularly,

more frequent liking and commenting). Instead, they preferred to use social media passively, meaning for example passive scrolling through social media without any interaction. The above mentioned active social media use can be passive social media use (for instance, scrolling through a social media feed without interacting), or beneficial and enhance mental wellbeing (Verduyn et al., 2015). This emphasizes the significance of taking into account the quality and nature of social media engagement when assessing its impact on the mental health of athletes.

In conclusion, while smartphones have become an integral part of modern life, excessive use may have negative impacts on mental health. Therefore, it is important for individuals, including athletes, to monitor their smartphone usage and develop strategies to promote healthy usage habits to maintain optimal mental health and overall well-being. Gaining insight into athletes' self-perceptions regarding their smartphone use could potentially assist coaches in devising more precise and evidence-informed strategies to address this matter.

3 SMARTPHONE USE AND PERFORMANCE FACTORS

3.1 Sleep

Quality sleep is undoubtedly one of the key elements for general well-being, mental health, as well as athletic performance. The term sleep can be defined as a reversible behavioral state in which an individual is perceptually disengaged from and unresponsive to the environment (Carskadon & Dement, 2005).

Although the importance of sleep is very clear and underlined by robust scientific evidence, elite athletes still experience sleep-related issues, such as sleep deprivation, insomnia, restlessness, or narcolepsy. In a study developed by the Australian Institute of Sport, athletes as well as coaches marked sleep as the most prominent problem causing tiredness or fatigue during seasons (Fallon 2007). Several investigations have suggested that elite athletes commonly fall short of the recommended minimum of eight hours of sleep per night, despite the crucial role of adequate rest in promoting optimal performance and recovery. This pattern of insufficient sleep appears to be widespread across a range of adult and youth sports, and there is no clear difference between genders, as reported by Gupta and colleagues in 2017.

Light exposure as a consequence of using a smartphone closely to the head, as scientific literature suggests, suppresses the production of melatonin (Lavie, 2001). Thus, short late-night exposure to small amounts of light can disrupt the production of melatonin, a crucial part of the circadian rhythm and sleep process. Smartphones have usually a display screens that expose users to a light when in use, and when messages, calls or different notifications are delivered. The most obvious piece of information to emerge from this scientific data is that athletes lying in bed, presumably in the dark with little or no light exposure, who would otherwise be producing melatonin, are exposed to light when

smartphones are nearby (Lanaj et al., 2014). The above-mentioned disturbance in melatonin production can lead to difficulty falling asleep and may result in shorter total sleep duration. Research conducted by Monma et al. (2018) indicates that using smartphones close to bedtime can increase a risk of sleep disorders among student athletes. This behavior may contribute to delayed sleep onset and reduced sleep duration, potentially affecting their overall sleep quality and performance.

Scientific studies have consistently demonstrated the essential role of sleep in cognitive functioning, including alertness, reaction time, memory, and decision making. For athletes, these cognitive abilities are critical for their performance on the field, making it essential that they prioritize getting enough sleep. Fullagar et al. (2015) summarized previous studies to support their claim that healthy adults who get less than 7 hours of sleep tend to have poorer cognitive performance. By ensuring that athletes get enough quality sleep, coaches and other support staff can help them to optimize their cognitive abilities and ultimately improve their performance.

Sleep plays a critical role in maintaining a healthy lifestyle, especially for athletes who need to perform at their best. Getting enough sleep is crucial in promoting physical and mental health, aiding in the body's recovery and repair processes, minimizing the risk of injuries, and supporting overall wellbeing. Exposure to smartphones may have a detrimental effect on healthy sleep, which is critical for optimal cognitive functioning and athletic performance, as demonstrated in various scientific investigations.

3.2 Mental fatigue

The term mental fatigue refers to a psychobiological state of an individual, defined by feelings of tiredness and a lack of energy generated by prolonged periods of cognitive demands (Smith et al., 2018). Scientific literature has previously identified different adverse

effects of mental fatigue on physical performance (e.g. Cutsem et al., 2017). Furthermore, mental fatigue may reduce the athlete's ability to perceive information, which may negatively affect the players' tactical behaviour during football or futsal match (Fortes et al., 2019).

For example, the study conducted by Fortes and colleagues (2019) revealed that a mere 30 minutes of smartphone exposure, particularly through active usage of social media applications, can cause mental fatigue in football athletes. This finding underscores the potential negative impact of smartphone use on the cognitive wellbeing of athletes and highlights the need for effective strategies to mitigate this issue. However, it is worth noting that the time period between arriving at the changing room, warming up, and starting the match typically lasts around 60 minutes, which may provide sufficient time for recovery from mental fatigue induced by smartphone app exposure.

In a study developed by Greco et al., (2017), researchers analysed technique of the fundamental football movements by standardized passing test. The results of this study confirmed detrimental effects of excessive smartphone use that may increase the occurrence of errors, as a result of increased mental fatigue. According to Smith et al. (2018), scientific evidence suggests that mental fatigue can have a significant negative impact on soccer-specific physical, technical, and perceptual-cognitive performance. This information is essential for coaches and athletes to consider when developing training programs and competition strategies. Additionally, similar research has found that mental fatigue can also impair performance in futsal, emphasizing the importance of managing mental fatigue in both soccer and futsal settings. Given the negative effects associated with the growing use of smartphones, it is crucial to explore effective strategies for reducing their impact on individuals' overall well-being.

3.3 Smartphone use prior to a competition

Recently, the use of smartphones and other electronic devices by elite-level athletes prior to competition has become a common sight. Such activities may include listening to music, watching motivational videos, or engaging in social media activities. While these activities may serve as a means of relaxation or psychological preparation for the upcoming competition, they may also have unintended consequences such as overstimulation, distraction, or onset of mental fatigue. As such, there is a need for coaches and trainers to carefully evaluate the potential benefits and risks of such activities and develop strategies to promote healthy and optimal pre-competition routines for athletes. In previous chapters, the scientific sources outlined focused mainly on effects of smartphone use that may decrease or somehow degrade the level of performance. However, using a smartphone can be a very crucial and helpful tool before or after a match for football, or futsal players.

Same players may choose to use smartphone to listen to music. A study by Middleton et al. (2017) identified that some athletes may prefer listening to music prior to competition to dissociate themselves from ongoing or upcoming events. This may be very beneficial strategy to avoid negative thoughts, feelings or emotions.

Use of smartphone before a match can be also beneficial for athletes in different ways. Possibility of having a video as a pre-competition strategy has become increasingly favored in elite sport. In the elite level of playing football or futsal, coaches or other performance staff of the team can provide a video-footages of past performances of athletes, as well as their opponents in the upcoming game (Middlemas & Harwood, 2020). This feature of smartphones gives coaches a valuable opportunity to improve players' individual or team performance.

However, smartphone use prior to a competition may have negative effects on players' psychological well-being. In a study developed by Gao et al. (2021) identified among group of university athletes that excessive smartphone use prior to competition is a risk factor for screen time is a risk factor for experiencing dispositional anxiety, pre-competition anxiety, and during-competition anxiety.

Although there is no available scientific research on what athletes do on their smartphones before a competition, a simplified version of what they do according to the available sources could show that athletes primarily use their phones for communication, as well as for entertainment purposes, like listening to music or playing games. These activities may help athletes relax and mentally prepare for the competition ahead. It is important to note that individual athletes may have varying preferences for their smartphone usage before a competition, and further research is needed to fully understand this behavior. It can be challenging to draw definitive conclusions about the smartphone use habits of athletes prior to training as well, as these behaviors tend to vary widely and can be influenced by numerous factors.

3.4 Physical factors

There has been significant scientific attention on the potential negative musculoskeletal effects associated with smartphone use, particularly when used excessively and in an unhealthy posture. There is an increasing concern that prolonged smartphone usage may lead to various musculoskeletal problems such as neck pain, shoulder pain, and wrist pain. When using a smartphone, the user's body is usually experiencing the discomfort of the musculoskeletal system and anatomically incorrect posture. The most reported musculoskeletal system complaint is pain symptom that can be seen especially in the fingers,

wrist and shoulders (Polat et al., 2021). As the duration of smartphone use increases, these symptoms and level of experienced pain increase.

Experience of a pain in the neck or wrist of a person's dominant hand, regular or heavy smartphone users, has been given more research focus as a result of the growing use of smartphone in head forward flexion postures (Lee et al. 2015). Pain in the neck, wrist, or thumb has been found to have a clear correlation with smartphone use, as evidenced by the study conducted by Eitivipart and colleagues (2018). These findings highlight the need for promoting healthy usage habits and raising awareness of potential musculoskeletal risks associated with prolonged and repetitive smartphone use.

In a study investigation thumb or wrist pain as a consequence of smartphone use, Baabdullah et al. (2020) concluded that participants who were classified as heavy users of smartphone have mild pain and stiffness in wrist or thumb. Publication by Park et al. (2015), that included also previous studies in regarding neck pain and smartphone use concluded, that the excessive use of a smartphone could produce considerable stress on the cervical spine and therefore cause neck pain. Neck pain has the potential to hinder an athlete's performance, leading to a decrease in their ability to perform at their optimal level. As such, it is essential for athletes, whether professional or amateur, to be aware of the potential negative musculoskeletal effects of smartphone use. This knowledge can help them take necessary precautions to maintain their physical health and their sport performance.

4 PURPOSE OF THE STUDY

This research aims to provide a valuable opportunity to advance the understanding of athletes' own perceptions on their smartphone use. While there are certainly benefits to using smartphones, evidence suggests that they may also have detrimental effects. There is growing understanding that excessive screen time or smartphone use among athletes in or outside of the training facilities is disadvantageous to performance outcomes, social interactions, or overall mental health and well-being. Understanding athletes' perceptions on smartphone use can inform the development of interventions and strategies to promote healthy technology habits and optimize athletic performance and well-being. Whilst some research has been carried out there is still very little scientific understanding of athletes' own awareness about their smartphone use. However, knowledge and data available about their smartphone use directly at the training, or game facilities, are rare. This study aims to generate fresh insight into this topic by answering following questions:

Question 1: Are there differences between professional and non-professional football/futsal players in smartphone dependence?

Question 2: Do professional and non-professional players experience different negative effects of their smartphone use?

Question 3: Are there differences in smartphone use between professional and non-professional football/futsal players during training days?

Question 4: What are the main predictors of the likelihood of continuing to use a smartphone despite knowledge of potential negative consequences among high level players of football/futsal players?

5 METHODOLOGY

5.1 Participants

The study recruited football and futsal players who were currently under a valid Player agreement in Finland during the years 2022 and 2023. The eligible participants were selected from several leagues in Finland, including the Veikkausliiga, Kansallinen Liiga, Ykkonen (Men), Ykkonen (Women), Kakkonen (Men), Kakkonen (Women), Miesten Futsal-Liiga, and Naisten Futsal-Liiga.

To ensure consistency and comparability of the data collected, the recruitment criteria were standardized across all the participating leagues, and only players who met the criteria were included in the study. Specifically, the inclusion criteria required that the players held a valid Player agreement during the specified period and were registered in one of the eligible leagues. By including players from a range of leagues, the study aimed to obtain a representative sample of the population of football and futsal players in Finland during the study period.

5.2 Data collection

To facilitate data collection, an online questionnaire hosted by Google Forms platform was distributed to the managers of the participating clubs via email and the smartphone app Whatsapp. The participants in this study were recruited through the Football Players Association of Finland (Jalkapallon Pelaajayhdistys) following the organization's approval. The participants provided informed consent to participate, and the recruitment process was fully voluntary, and participants had the right to withdraw their participation at any time without consequence. The study also provided participants with detailed information on how their data would be used and stored, according to the latest University

of Jyväskylä regulations. Additionally, a brief article was shared on the Football Players Association's social media platforms to generate interest and awareness about the study.

This study used a combination of established questionnaires and self-developed items to answer our research questions. The proportion of questionnaires used in the study includes the Problematic Smartphone Use Questionnaire (PMPUQ) developed by Billieux et al. (2008). Questions focusing on Dependence (questions 1, 4, and 5), and Probability of Use (question 20).

Additionally, the Smartphone Addiction Scale (SAS) (Kwon et al., 2013) was employed, specifically focusing on Tolerance (questions 3 and 22), Daily Life Disturbance (questions 7 and 9), Overuse (question 8), Positive Anticipation (questions 6 and 10), Cyber-spaced Oriented Relationship (question 11), and Withdrawal (question 21).

Furthermore, a set of self-developed questions were included, which covered a range of factors related to smartphone use in the sport environment, including own items (questions 2, 12, 13, 14, 15, 16, 17, 18, 19, and 23).The participants' responses were collected using a Likert scale ranging from 1 to 5, with the following verbal anchors provided: 1 representing "Strongly Disagree," 2 indicating "Disagree," 3 denoting "I Do Not Know," 4 representing "Agree," and 5 indicating "Strongly Agree."

The data collection period commenced on October 18th, 2022, and was closed on February 10th, 2023. There was no deadline for participants to complete the questionnaire, allowing them to do so at their own convenience. It is worth noting that the questionnaire was conducted in English and that it was the only available language for the questionnaire.

5.3 Data analysis

The data collected for this study were analyzed using the t-test and regression analysis, where appropriate. The two-tailed t-test was used to determine the statistical significance of the differences between two groups, and regression analysis was employed for the research question 4 to investigate the relationship between two or more variables.

6 RESULTS

The study involved a total of 182 football or futsal players in Finland with a valid Player agreement in the years 2022 or 2023. The average age of the participants was 22.10 years. Of the 182 participants, 132 were male (72.5%) and 50 were female (27.5%). Playing-level wise, there were 63 participants from Veikkausliiga / Kansallinen Liiga, 46 participants from Ykkonen, 32 participants from Kakkonen, and 41 participants from Miesten / Naisten Futsal-Liiga. The participant group consisted of 182 individuals, of which 71 were professional football or futsal players who played the sport full-time. These 71 participants specifically indicated that playing their sport constituted their primary source of income. Additionally, there were 41 participants who played futsal specifically.

One response was excluded from the data analysis as it did not meet the inclusion criteria set for the study. The base criteria for inclusion included being a football or futsal player with a valid Player agreement in Finland during the years 2022 and 2023, and being registered in one of the eligible leagues, including the Veikkausliiga, Kansallinen Liiga, Ykkonen (Men), Ykkonen (Women), Kakkonen (Men), Kakkonen (Women), Miesten Futsal-Liiga, or Naisten Futsal-Liiga.

Question 1: Are there differences between professional and non-professional football/futsal players in smartphone dependence?

For our research question 1 regarding smartphone dependence, we conducted independent samples t-tests in SPSS to compare the means of two groups on multiple test variables. Specifically, we examined the mean differences in question 1. (I find it difficult to turn off my smartphone), question 4. (I feel lost without my smartphone), and question 5. (I can never spend enough time on my smartphone) between Group 1 (Professional football/futsal players) and Group 2 (Non-professional football/futsal players).

Table 1

Results of T-Test for Research Question 1

Test variables	Professionals		Non-professionals		*t*(180)	*p*	Cohen's *d*
	M	*SD*	*M*	*SD*			
Smartphone separation difficulty	2.69	1.064	2.7	1.331	-.55	.956	-.088
Smartphone dependency	3.45	.923	2.77	1.027	4.673	<0.01	-.007
Persistent need for smartphone interaction	3.28	1.233	3.41	1.331	-.687	.493	-.122

For Smartphone separation difficulty (question 1), the results between Professionals (M = 2.69, SD = 1.064) consisting of 71 professional football/futsal players and Non-professionals (M = 2.7, SD = 1.331) consisting of 111 amateur players, t(170.9) = -0.55, p = .956 indicate no statistically significant differences between professional and non-professional football/futsal players.

For Smartphone dependency (question 4), there was a significant difference between Professionals (M = 3,45, SD = ,923) and Non-professionals (M =2,77, SD = 1,027); t(160,653) = 4,673 , p = <0,01. Therefore, we can conclude that there is a statistically significant difference between the mean scores of Professionals and Non-professionals, with professional football/futsal players showing higher scores.

Finally, for Persistent need for smartphone interaction (question 5), Professionals (M = 3.45, SD = 1.205) had a lower mean score than Non-professionals (M = 3.59, SD = 1.163), although the difference was small. The t-value of -.797 and p-value of .213 indicated that this difference was not statistically significant.

In conclusion, the data analysis for first research question (Are there differences between professional and non-professional football/futsal players in smartphone dependence?) concluded that being a professional or non-professional football/futsal player did not make a significant difference for variable 1, while there was a statistically significant difference favoring amateur players for variable 2. For variable 3, although there was a small difference between the groups, it was not statistically significant.

Question 2: Do professional and non-professional players experience different negative effects of their smartphone use?

To answer research question 2, which looks at possible different negative experiences in how professional and non-professional players perceive negative effects of their smartphone use, we used independent sample t-tests in SPSS to compare the results of the two mentioned groups.

Table 2

Results of T-Test for Research Question 2

Test variables	Professionals		Non-professionals		*t*(180)	*p*	Cohen's *d*
	M	*SD*	*M*	*SD*			
Difficulty reducing smartphone use	3.17	1.014	2.99	1.057	1.136	.258	.171
Sleep interference	2.63	1.018	2.48	1.069	.991	.323	.149
Disuse anxiety	3.62	1.033	3.69	1.182	-.445	.657	-.066
Smartphone-induced physical pain	3.51	1.340	3.63	1.321	-.610	.543	-.093
Compulsive social media use	2.24	1.314	2.08	1.105	-.188	.401	.113

We analysed the possible differences with variable 1 (I have tried to spend less time on my smartphone but I am not able to), variable 2 (I lose sleep time due to the time I spend on my smartphone), variable 3 (I feel anxious if I have not checked my smartphone, messages, or switched on my smartphone for a while – more than 10 minutes), variable 4 (I experience feeling pain in my wrists or at the back of my neck while using my smartphone), and finally variable 5 (I always check my social media - Facebook, Instagram, Twitter, Snapchat etc., right after I wake up - in less than 5 minutes.)

For variable 1 (I have tried to spend less time on my smartphone but I am not able to), we received following results : Professionals (M = 3,17, SD = 1,014) and Non-professionals (M =2,99 SD = 1,057); t(153,874) = 1.136, p = ,258 , which lead us to conclusion that for this variable the difference between Professionals and Group 2 is not statistically significant.

Analysis of variable 2 (I lose sleep time due to the time I spend on my smartphone) showed following results: Professionals (M = 2,63, SD = 1,018) and Non-professionals (M =2,48 SD = 1,069); t(154,663) = .991, p = ,323, indicating that there is no statistically significant difference between the means of our 2 groups.

The results of the independent samples t-test for variable 3 (I feel anxious if I have not checked my smartphone, messages, or switched on my smartphone for a while – more than 10 minutes), indicate that there is no statistically significant difference between the means of Professionals (M = 3.62, SD = 1.033) and Non-professionals (M = 3.69, SD = 1.182)); t(163,355) = -.445, p = ,657.

For variable 4 (I experience feeling pain in my wrists or at the back of my neck while using my smartphone). The results of the independent samples t-test indicate that there is no statistically significant difference between the means of Professionals (M = 3.51, SD = 1.340) and Non-professionals (M = 3.63, SD = 1.321) (t(147.694) = -.610, p = .543).

The results of investigating variable 5 (I always check my social media - Facebook, Instagram, Twitter, Snapchat etc., right after I wake up - in less than 5 minutes.) using The independent samples t-test results indicate that there is no statistically significant difference between the means of Professionals (M = 2.24, SD = 1.314) and Non-professionals (M = 2.08, SD = 1.105) (t(130.596) = .842, p = .401).

This question investigated five variables related to negative experiences of smartphone use. The results of the independent samples t-tests revealed that there were no statistically significant differences between professional and non-professional football or futsal players for any of the variables.

Question 3: Are there differences in smartphone use between professional and non-professional football/futsal players during training days?

Table 3

Results of T-Test for Research Question 3

Test variables	Professionals		Non-professionals		*t*(180)	*p*	Cohen's *d*
	M	*SD*	*M*	*SD*			
Smartphone use before training	2.38	1.005	2.33	1.065	0.300	.764	.045
Smartphone use after training	2.04	.620	1.88	.723	1.585	.115	.233
Smartphone check habit	3.28	1.233	3.41	1.331	-.687	.493	-.103
Forbidden smartphone use	4.15	0.905	4.18	0.844	-.188	.851	-.209

For our research question 3 aiming to outline any possible differences between behavior on training days, we conducted independent samples t-tests in SPSS to compare the means of two groups on multiple test variables. Specifically, we examined the mean

differences in variable 1 (I use my smartphone in the changing room before training sessions), variable 2 (I use my smartphone in the changing room after training sessions), variable 3 (After coming back to changing room from training/game, I usually check my smartphone before I take my football/futsal boots off.), and variable 4 (I use my smartphone when it is forbidden/not allowed to do so – in stadium; changing room; team-meetings etc.) between Group 1 (Professional football/futsal players) and Group 2 (Non-professional football/futsal players).

For variable number 1 (I use my smartphone in the changing room before training sessions), Professionals (M = 2,38, SD = 1,005) and Non-professionals (M =2,33 SD = 1,065); t(155,527) = .300, p = ,764, the results indicate that the difference between Group 1 and Group 2 is not statistically significant.

For variable number 2 (I use my smartphone in the changing room after training sessions), the results are as follows: Professionals (M = 2,04, SD = ,620) and Non-professionals (M =1,88 SD = ,723); t(165,240) = 1,585, p = ,115 .Thus, we cannot conclude that there is a statistically significant difference between the two groups.

Analysis of the variable number 3 (After coming back to changing room from training/game, I usually check my smartphone before I take my football/futsal boots off), Professionals (M = 3,28 SD = 1,233) and Non-professionals (M =3,41 SD = 1,331); t(157,586) = -,687, p = ,493 showed that there is no evidence of a statically significant difference in behaviour between professionals and non-professionals.

For variable 4 (I use my smartphone when it is forbidden/not allowed to do so – in stadium; changing room; team-meetings etc.), the mean score for Professionals was 4.15 with a standard deviation of 0.905, while Non-professionals had a mean score of 4.18 with a standard deviation of 0.844. A two-sample t-test was conducted with 141 degrees of

freedom, and the resulting t-value was -0.188 with a p-value of 0.851. As the p-value is greater than the significance level of 0.05, there is no statistically significant difference between the means of the two groups.

In order to answer the research question number 3, four variables related to smartphone use on training days were analyzed in professional football/futsal players and non-professional. The results indicate that there is no statistically significant difference the two groups for the first two variables, which are related to smartphone use before and after training sessions. Similarly, no evidence of a significant difference in behavior between professionals and non-professionals was found for variable number 3. For variable number 4, which concerns the use of smartphones in prohibited areas, the analysis showed that there is no statistically significant difference between the two groups. Overall, these findings suggest that there are no notable distinctions in smartphone usage between the two groups.

Question 4: What are the main predictors of the likelihood of continuing to use a smartphone despite knowledge of potential negative consequences among high level players of football/futsal players?

We formulated our research question to focus on the role of age, gender, and player status (professional or amateur) as potential predictors of continued smartphone usage. To answer this question, we employed a linear regression analysis on survey data collected from the participants.

Table 4

Results of Regression Analysis for Research Question 4

Variables	Coefficient	*SE*	t	*p*
I will continue to use my smartphone as I do now, despite knowing it would be better to spend less time.				
Gender	−.382	.177	−2.162	.032
Age	−.055	.019	−2.831	.005
Professional / Amateur	−.058	.158	−.336	.715
Constant	4.411	.530	8.316	<.001
R - squared				.062

The results of the analysis revealed that age was a significant predictor of smartphone usage ($\beta = 0.55$, $p < .001$). The regression analysis predicts a negative association between increasing age and participants' intention to continue using their smartphones, suggesting that as age increases, the inclination to use smartphones diminishes. Specifically, for every one-year increase in age, participants reported an intention to continue using their smartphones, on average, 0.55 less times per day, while holding other variables constant. These findings suggest that age is a strong predictor of smartphone usage and that younger individuals are more inclined to use their smartphones more frequently, which may ultimately place them at a higher risk.

7 DISCUSSION

Exploring the issue of problematic smartphone use among athletes (in our research aged 16-38) is an important research area due to the high occurrence of smartphone addiction among young adults in general. As highlighted by Csibi et al. (2019), individuals between the ages of 20-34 are particularly vulnerable to smartphone-related addictive behavior. Moreover, Horwood et al. (2021) reported that problematic smartphone use was prevalent and stable among young adults but started declining sharply after the age of 40.

Our first research question results showed that professional athletes had a statistically significant higher tendency to feel lost without their smartphones than non-professional players. However, we did not measure the average smartphone use time, which makes it difficult to draw definite conclusions. In a study conducted by Júdice et al. (2022), it was observed that despite athletes dedicating more time to physical activity compared to the general population, the evidence suggests that their sedentary time remains comparable. In other studies, the professional athletes engaged in longer sedentary behavior daily than average population (Sperlich et al., 2017).

It was also found that there were no significant differences between the two groups in terms of smartphone usage or overall dependence. According to a recent meta-analysis conducted by Jahrami et al. in 2022, the study findings indicate that symptoms associated with smartphone dependence are universally present among individuals in the entire population, therefore encompassing both non-professional and professional players. These results suggest that the variance in smartphone dependence between professional and non-professional athletes may be limited to the feeling of being lost without their device rather than overall usage or dependence. To support this finding, previous study by King et al. (2013) had revealed a correlation between excessive smartphone use and negative mobile

phone dependency, which would make the explanation of these results easier, if we had access to the time of smartphone usage.

According to Twenge (2017), there has been a faster pace of generational change in Gen Z youth than in previous generations, which she attributes to the widespread use of smartphones. This change could come as a surprise to coaches. Our research results supports this idea by demonstrating that age is a significant predictor of smartphone use despite awareness of potential negative consequences, with younger individuals using their devices more frequently. There are number of studies where age was found as a negative predictor for excessive smartphone use or behavioural habits related to smartphone use (Van Deursen et al., 2015), (Andone et al., 2016), (Mitchell & Hussain, 2018), which relate to our findings as well. However, it is important to note that age is just one factor that may influence smartphone use among athletes, and further research is needed to better understand this complex relationship. Future investigations could include additional factors that may impact smartphone use among athletes, including the influence of social media platforms, psychological aspects such as self-regulation, the possible role and influence of team dynamics and cohesion, and its potential effects of smartphone use on both athletic performance and overall well-being. Exploring these dimensions would contribute to a more comprehensive understanding of the intricate relationship between smartphone usage and its implications for athletes.

DesClouds (2022) suggests that smartphones can have both positive and negative impacts on self-regulation, performance, and well-being. Thus, regardless of the intended use, it is crucial to manage smartphones effectively. The results obtained from a study conducted on English Premier League footballers revealed that a significant portion, specifically 79%, of their post-training time was spent in sedentary activities (Weiler et al., 2015). These outcomes indicate that professional footballers are spending an alarming

amount of time in inactive leisure activities. This thesis findings further support this notion, as higher scores across multiple questions may indicate same patterns of behavior among athletes. We suggest that taking measures to address athletes' sedentary behavior is crucial, including reducing the use of electronic devices such as smartphones, as they may have adverse impacts on their overall health and athletic performance.

Based on the existing literature, it is not surprising that the psychological effects of smartphone use for adults can be applied to athletes. While more research is needed to fully understand the impact of smartphone use on athletes specifically, it is clear that excessive smartphone use can have negative consequences for both athletes and the general adult population (Pera, 2020; Karsay et al., 2019).

7.1 LIMITATIONS

This study acknowledges several limitations. Firstly, the questionnaire was administered in English, potentially hindering the comprehension of some words and leading to incomplete or inaccurate responses. Secondly, the relatively small and difference in sample size may limit the generalizability of the findings to a larger population. Lastly, the use of self-report measures introduces the possibility of a bias, where participants may have provided responses based on societal expectations rather than their true behaviors. The reliability of the study may be affected by the use of a self-report questionnaire, as it is possible that participants in this research may have underreported their smartphone usage and negative experiences or behaviors during training days. This could potentially limit the accuracy of the findings and conclusions drawn from the study.

7.2 CONCLUSIONS

The results of this study emphasize the importance of age as a significant factor contributing to higher patterns of smartphone use among athletes. It is interesting to note that both professional and amateur athletes demonstrated similar usage patterns, showing a tendency towards intensive smartphone use regardless of their level of play. However, it is crucial to acknowledge that these findings indicate the need for athletes to improve their smartphone use behaviors and attention should be paid to younger athletes in relationship towards their smartphone use.

Efforts should be directed towards promoting mindful smartphone use and healthier habits among athletes, irrespective of their playing level. This can be achieved by implementing interventions that enhance athletes' awareness of the potential consequences associated with excessive smartphone use. It is important to educate athletes about the negative impacts of prolonged screen time, disrupted sleep patterns, excessive sedentary behaviour outside of their sport and low-quality social interactions. By understanding the risks involved, athletes can make more informed choices about their smartphone use.

Moreover, interventions should encourage athletes to adopt a balanced approach to smartphone usage. This can involve setting limits on screen time, establishing designated periods without smartphone use, and engaging in alternative activities that promote overall well-being and athletic performance. Encouraging participation in physical activities, social interactions, and mindfulness practices can help athletes reduce their reliance on smartphones and foster healthier habits. By focusing on promoting healthy habits and balance in smartphone use, athletes can develop habits that support their optimal athletic performance and overall well-being.

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