RESEARCH ARTICLE

Post-Pandemic Dynamics of Mobile Health and Fitness Applications: An Analysis of User Profiles, Market Developments, and Emerging Trends

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ABSTRACT

Background: The proliferation of digital technologies and the widespread adoption of smartphones have catalyzed a profound transformation in healthcare delivery, particularly through mobile fitness and health applications. Initially emerging in the early 2000s, these applications have evolved since the 2010s into multifaceted platforms offering nutrition planning, exercise motivation, health monitoring, and social interaction functionalities. The COVID-19 pandemic significantly accelerated this trend, as the global demand for home-based exercise solutions and remote health monitoring surged, resulting in a substantial increase in application usage. These tools hold considerable potential to enhance quality of life, foster health consciousness, and alleviate the burden on healthcare systems. However, challenges persist regarding user expectation alignment, data security assurance, and the maintenance of long-term user engagement.

Methods: This study employed a qualitative research design, utilizing document analysis to examine mobile fitness and health applications available in the Google Play Store and Apple App Store between 2020 and 2025, specifically those with user ratings between 4.5 and 5.0. The analysis focused on the post-pandemic status of these applications, user demographics, market size, health-promoting impacts, and common challenges encountered. Data sources included peer-reviewed academic publications, industry reports, and official statistical databases. The collected data were subjected to systematic content analysis, and contemporary literature findings were compared with prevailing trends in the digital health sector.

Results: Based on the findings, the distribution of health and fitness mobile applications indicates that the majority of the applications are free (%73.2), and their total number of downloads (1,244,678,160) is significantly higher compared to paid applications (%88.43). Regarding publication years, applications released between 2020 and 2025 (%51.6) stand out in terms of total downloads. In terms of rating ranges, the highest proportion (%22.9) corresponds to applications rated 4.8, which have been downloaded 389,387,020 times. Concerning gender targeting, most applications are unisex (%70.6), while applications targeting women (%22.9) and men (%6.5) are relatively limited. When comparing applications released before and after the COVID-19 pandemic, those published after the pandemic (%52.3) account for a higher share of total downloads. Categorized by download numbers, 29.4% of the applications have reached 10 million or more downloads. In terms of content type, the largest share (%62.7) belongs to the Fitness and Health category. Analysis of total downloads between free and paid applications shows a dominance of free applications (%88.43). Regarding revenue, most applications (%69.23) generate monthly income between 0–100,000 TL, while only 30.77% achieve 100,000 TL or more. The first published application in the health and fitness category was **Adidas Running: Run Tracker** on November 23, 2010, and the most recent application is **Vizzta**, released on March 11, 2025. Overall, these findings indicate a significant increase in the use of health and fitness applications in recent years, with free and unisex applications playing a key role in user preferences.

Conclusion: Mobile fitness and health applications occupy a strategically significant position in promoting quality of life and advancing digital health literacy. Nevertheless, there remains a need for strategic innovations to address sustained user retention, data privacy safeguards, and seamless integration into healthcare systems. Additionally, the integration of these applications with wearable technologies, coupled with personalized service delivery through advanced data analytics, presents promising opportunities to enhance user experience and interaction.

Introduction

Mobile sports and fitness applications are innovative tools developed to increase individuals' physical activity levels and promote healthy lifestyle habits, enabled by the widespread adoption of digital technologies. Their foundations were laid in the early 2000s with the rise of mobile phone usage, and with the development of smartphones and mobile application platforms, they became more functionally comprehensive in the 2010s[1-3]. These applications offer multidimensional features such as exercise tracking, workout planning, nutritional guidance, health data monitoring, motivation support, and social interaction, thus providing user-centered digital health solutions[4].

Usage rates of these applications have significantly increased, particularly during the COVID-19 pandemic. Restrictions on gym access led individuals to exercise at home, accelerating the widespread adoption of mobile fitness applications[5]. Even in the post-pandemic period, certain fitness apps have maintained their popularity, and personalized digital health solutions have begun to become permanent. These applications enable users to monitor, analyze, and share their health data with healthcare professionals, contributing to data-driven decision-making processes[6].

Mobile health applications are classified into two main categories: those intended for healthcare professionals (e.g., patient monitoring, clinical decision support systems, professional training) and those designed for individual users (e.g., fitness, health education, personal health records, social support). This diversity highlights the increasingly significant role of mobile applications in both individual health management and the digital transformation of healthcare systems[7].

The effectiveness of mobile applications is not limited to increasing physical activity; they also encourage behavior changes that support healthy lifestyles[8,9]. For example, applications like HelpDiabetes facilitate tracking of carbohydrates, fats, and proteins, monitoring glucose levels, and managing sports and daily activities[10]. Platforms such as Google Fit integrate with other applications to provide users with a holistic view of their health status[11].

The rise in obesity and chronic diseases associated with physical inactivity positions mobile fitness applications as preventive and supportive digital solutions[12-15]. These applications serve as strategic tools to strengthen public health by offering features such as physical activity monitoring, support for healthy eating, behavior change facilitation, increased user motivation, and effective communication with healthcare professionals[16].

The portability of mobile devices in daily life enables real-time monitoring and guidance of physical activity behaviors, allowing these applications to play a more active role in health tracking[6]. These applications provide comprehensive digital health services that not only promote physical activity but also support the reduction of harmful habits, thereby appealing to a wide range of age groups[17].

Increasing user demand and competitive market conditions encourage developers to integrate features such as user-friendly interfaces, personalized content, real-time feedback, and comprehensive training programs[18]. However, despite the widespread use of mobile health applications, issues related to personal data security, privacy, and ethical usage remain important areas of discussion[19]. Therefore, developers need to update their security policies and employ technologies that effectively protect user data.

This study aims to systematically examine the post-pandemic status of mobile fitness applications within this context, including user profiles, market growth, health impacts, and the structural challenges encountered. Additionally, it seeks to evaluate the potential contributions of these applications to public health systems and to provide recommendations for sustainable development in the field of digital health.

Materials and Methods

In this study, the document analysis method, one of the qualitative research designs, was used to understand the future and impacts of mobile fitness and health applications. Document analysis is a method that allows for the systematic examination of existing written materials related to the research topic[20]. Applications with ratings between 4.5 and 5 under the category of "Fitness and Health" available in the Turkish market were reviewed on Google Play Store and App Store. The study addressed the post-pandemic development of fitness and health

applications, user profiles, problems of the applications, market size, health impacts, and encountered challenges. A literature review related to mobile fitness and health applications was conducted within the scope of the research. Data were collected from academic articles, industry reports, statistical data, user comments on mobile applications, and publications from international organizations. These documents were selected from reliable sources and analyzed to answer the research questions.

Results

Table 1. Health and Fitness Mobile Applications

Applications	f	%	Number of Downloads
Free	112	73,2	1.244.678.160
Paid	41	26,8	455.701.840
Total	153	100,0	1.700.380.000

Table 1 shows the number, percentage distribution, and download counts of free and paid applications. There are a total of 153 applications, of which 112 (73.2%) are free and 41 (26.8%) are paid. The total number of downloads for free applications is 1,244,678,160, while the total number of downloads for paid applications is 455,701,840. The combined total number of downloads for all applications is 1,700,380,000.

Table 2. Publication Years of Health and Fitness Applications

Years	f	%	Number of Downloads
2010–2013	17	11,1	188.742.180
2014–2019	57	37,3	634.241.740
2020–2025	79	51,6	877.396.080
Total	153	100	1.700.380.000

Table 2 shows the distribution of applications by their release years, their percentage shares, and total download numbers. The majority of applications (51.6%) were released between 2020 and 2025, with a total of 877,396,080 downloads during this period. Between 2014 and 2019, 57 applications (37.3%) were downloaded 634,241,740 times, while 17 applications (11.1%) released between 2010 and 2013 reached 188,742,180 downloads. In total, 153 applications have been downloaded 1,700,380,000 times.

Table 3. Score Table of Health and Fitness Applications According to Score Range

	f	%	Number of Downloads
4,5 Point	15	9,8	166.637.240
4,6 Point	27	17,6	299.266.880
4,7 Point	24	15,7	266.959.660
4,8 Point	35	22,9	389.387.020
4,9 Point	33	21,6	367.282.080
5,0 Point	19	12,4	210.847.120
Total	153	100	1.700.380.000

Table 3 presents the distribution of applications according to their ratings, their percentage shares, and total download numbers. The largest group of applications (22.9%) have a rating of 4.8, with a total of 389,387,020 downloads. Thirty-three applications (21.6%) with a rating of 4.9 have been downloaded 367,282,080 times. Additionally, 17.6% of the applications (27 apps) have a rating of 4.6, 15.7% (24 apps) have a rating of 4.7, 12.4% (19 apps) have a rating of 5.0, and 9.8% (15 apps) have a rating of 4.5. In total, 153 applications have been downloaded 1,700,380,000 times.

Table 4. Gender Distribution of Health and Fitness Applications

	f	%	Number of Downloads
Woman	35	22,9	389.387.020
Man	10	6,5	110.524.700
Unisex	108	70,6	1.200.468.280
Total	153	100	1.700.380.000

Table 4 shows the distribution of applications according to their target audience (female, male, unisex), their percentage shares, and total download numbers. The majority of the applications (70.6%) are classified as unisex, with a total of 1,200,468,280 downloads. The number of applications targeted at women is 35 (22.9%), with a total of 389,387,020 downloads. The number of applications targeted at men is 10 (6.5%), with a total of 110,524,700 downloads. In total, 153 applications have been downloaded 1,700,380,000 times.

Table 5. Health and Fitness Apps Published Before and After Covid-19

	f	%	Number of Downloads
Before Covid-19	73	47,7	810.181.260
After Covid-19	80	52,3	889.300.740
Total	153	100,0	1.700.380.000

Table 5 shows the number of applications released before and after the COVID-19 pandemic, their percentage distributions, and total download numbers. Approximately half of the applications (47.7%) were released before the COVID-19 pandemic, with a total of 810,181,260 downloads.

The number of applications released after the pandemic is higher (52.3%), with these 80 applications having a total of 889,300,740 downloads. In total, 153 applications have been downloaded 1,700,380,000 times.

Table 6. Distribution of Fitness and Health Applications by Downloading Ranges

	f	%	Number of Downloads
1M and below	43	28,1	477.806.780
1M+	33	21,6	367.282.080
5M+	10	6,5	110.524.700
10M+	45	29,4	499.912.920
50M+	22	14,4	244.854.720
Total	153	100	1.700.380.000

Table 6 shows the distribution of applications categorized by the number of downloads along with their percentage shares. The largest portion of applications (29.4%) have 10 million or more downloads, with a total of 499,912,920 downloads in this category. Forty-three applications (28.1%) have 1 million or fewer downloads, totaling 477,806,780 downloads. Thirty-three applications (21.6%) have more than 1 million downloads, 22 applications (14.4%) have over 50 million downloads with 244,854,720 total downloads, and 10 applications (6.5%) have more than 5 million downloads with 110,524,700 total downloads. In total, 153 applications have been downloaded 1,700,380,000 times.

Table 7. Distribution of Fitness and Health Applications by Content Types

Application Categories	f	%	Number of Downloads
Fitness and Health	96	62,7	1.085.057.460
Weight Loss	19	12,4	214.567.120
Abdominal Exercises	8	5,2	89.979.760
Pilates	23	15,0	259.557.000
Arm and Leg Exercises	7	4,6	79.600.080
Total	153	100,0	1,700,380,000

Table 7 shows the distribution of applications by categories, their percentage shares, and total download numbers. The majority of the applications (62.7%) fall under the Fitness and Health category, with a total of 1,085,057,460 downloads. The Pilates category includes 23 applications (15.0%) with 259,557,000 downloads, while the Weight Loss category consists of 19 applications (12.4%) with 214,567,120 downloads. The Abdominal Exercises category has 8 applications (5.2%) with 89,979,760 downloads, and the Arm and Leg Exercises category includes 7 applications (4.6%) with 79,600,080 downloads. In total, 153 applications have been downloaded 1,700,380,000 times.

Table 8. Total Downloads of Paid and Free Health and Fitness Applications

	Free Applicaitons	Paid Applications
Number of Downloads	1,503,660,000	196,720,000
%	%88,43	%11,57
Total Download Count	1,700,380,000	

Table 8 shows the distribution of the total number of downloads between free and paid applications. Of the total 1,700,380,000 downloads, 1,503,660,000 (which corresponds to 88.43%) belong to free applications. The total number of downloads for paid applications is 196,720,000, representing an 11.57% share. This indicates that free applications hold a significant share of the total downloads.

Table 9. Distribution of Health and Fitness Applications by Price Per Download

Price	0,00/100,000 TL	100,000 TL ve üzeri
Number of Applications	27	12
%	%69,23	%30,77
Number of Downloads	78.928.123	35.081.877
Total	114.010.000	

Table 9 shows the distribution of applications according to their monthly revenue. The majority of applications (69.23%) generate monthly revenue between 0.00 and 100,000 TL; the number of applications in this category is 27, with a total of 78,928,123 downloads. The number of applications generating monthly revenue of 100,000 TL or more is 12 (30.77%), and the total downloads for these applications amount to 35,081,877. In total, 39 applications have a combined download count of 114,010,000.

Table 10. First and Last Published Application Among Health and Fitness Applications

First Released Application	The application called Adidas Running: Run Tracker was released on November 23, 2010.
Latest App	The application called Vizzta was released on March 11, 2025.

Table 10 presents the first and latest mobile applications released in the health and fitness category. Adidas Running: Run Tracker was launched in 2010, becoming one of the pioneering apps in this field. In contrast, the most recently released application, Vizzta, was introduced to users in 2025.

Mobile Fitness and Sports Applications Market

The mobile fitness application market has experienced significant growth in recent years, driven by digital transformation. According to estimates by Technavio, the global market has a growth potential of approximately 1.68 billion USD during the 2020-2024 period. Similarly, a study conducted by Polaris Market Research projects that the market will reach 14.7 billion USD by 2026[21]. Straits Research further extends this estimate, indicating that the market size will reach 30.63 billion USD by 2030. According to data provided by Adjust, in-app advertising spending for mobile applications is expected to increase from 447.4 million USD in 2023 to 677.7

million USD in 2027. Although there are numerical differences among the forecasts of research firms, the overall trend points to steady market growth. The global commercial value of mobile applications was reported to be approximately 190 billion USD annually.[22]

In the European market specifically, the pandemic caused notable fluctuations in the fitness and wellness sector. Fitness center revenues in Europe were around 29 billion Euros in 2019 but decreased by 40% to 17 billion Euros in 2022.[23] This decline is attributed to the reduced interest in traditional gyms post-pandemic and the increasing prevalence of individual exercise habits directed through outdoor activities and mobile applications.

The case of Turkey differs somewhat from Europe. Although there was a 70% increase in demand for gyms during the pandemic, this trend reversed afterward. Despite this decline, the mobile fitness market in Turkey is projected to generate revenue of 511.6 million USD in 2023[23]. However, there was a 28% decrease in session numbers for mobile fitness applications in 2021 and a 25% decrease in 2022. The slowdown in the Turkish market is attributed to sociocultural factors such as individuals returning to pre-pandemic traditional exercise habits and an increased tendency towards socializing. Additionally, the predominance of foreign-origin mobile fitness applications in Turkey creates inadequacies in meeting local user expectations, highlighting the need to develop solutions tailored to local cultural dynamics[23].

Expected Future Market Trends for Mobile Sports Applications

Globally, increasing awareness of healthy living and physical activity is driving a significant rise in the use of mobile sports applications. This trend, together with technological advancements, is shaping the future market potential of these applications. In particular, the widespread adoption of wearable technologies enables a more integrated and data-driven interaction between mobile sports apps and users. Physiological indicators such as heart rate, step count, and sleep patterns are integrated into mobile devices, allowing exercise to be monitored on a more scientific basis[24].

Moreover, growing user demand for personalized solutions is increasing interest in customized training and nutrition programs. Accordingly, future mobile sports applications are expected to offer more tailored content. In terms of social interaction, apps that create online communities to boost motivation among users and encourage competition are particularly noteworthy.

Additionally, with increasing cross-sector collaborations, mobile sports applications may provide integrated solutions with gyms, equipment manufacturers, educational institutions, and other health platforms. For example, school-based applications could monitor students' physical development, or gym reservations could be made directly through the app[25].

Finally, through the analysis of extensive data sets collected by these applications, detailed feedback on users' performance can be provided, enabling more effective management of sports and health processes on an individual level. In this context, advanced data analytics and artificial intelligence–supported recommendation systems are expected to become more widespread in mobile sports applications.

User Profile of Mobile Applications

With the widespread use of smartphones, data collected through mobile applications are classified into four main categories: lists of installed apps, app usage records, installation behaviors, and app metadata. Since smartphones are mostly associated with individual use, this data also includes personal information such as demographic characteristics, personality traits, psychological states, interests, and lifestyles[19]. In this context, data obtained from mobile applications enable the creation of user profiles that support both planning tailored to

individual expectations and the development of user experiences backed by statistical analyses.

Fitness and health applications are heavily downloaded, especially in countries like China, the USA, India, Russia, and the UK. Although usage statistics vary across different sources, it is generally reported that content supporting mental and physical health is more prevalent among older adults, alongside activities such as yoga, dance, and cross-fit aimed at the general population[24]. Interest in these applications is high among young and middle-aged individuals, with their greater technological affinity being a significant factor driving usage rates[26]. On the other hand, with increasing health awareness among older users, a notable trend toward mobile fitness applications has emerged in this group as well. A study conducted in China found that 41% of mobile health app users were women[27]. In a Turkey-based study, 28.9% of men and 39.8% of women reported using such applications[28].

A study conducted in the Alpine region of Europe reported that 31.9% of participants tried new sports opportunities during extended restrictions, while 72.4% preferred digital applications and online tools[29]. However, high download rates of applications can be misleading regarding continued usage. Research indicates that approximately 80% of users reduce their active usage within a week after downloading an app. To accurately measure app performance, a follow-up period of at least four weeks is recommended[30]. About 49% of users use applications at least 11 times, and 21% use them more than 50 times[31]. Health, fitness, and physical activity apps make up 5.18% of the total mobile app market, with daily usage rates of downloaded apps at 35%[33]. Specifically in Turkey, 21.9% of internet users actively use these applications, ranking the country 26th globally in this regard[34].

Challenges of Mobile Fitness and Sports Applications

Mobile sports applications stand out as important tools for supporting individuals' exercise habits and sustaining physical activities. However, their widespread use also brings certain limitations and challenges. The first of these limitations is the difficulty in maintaining users' motivation and engagement over time. Applications initially used with high motivation may see a decline in user interest as the content becomes repetitive and monotonous[35,36].

Another significant issue is that the exercise, nutrition, and health information provided in these apps may lack scientific basis, be incomplete, or inaccurate. This situation can lead users to develop unhealthy habits or perform exercises incorrectly. Moreover, most mobile applications offer generalized recommendations without sufficiently accounting for individual differences, making it harder to achieve personal goals and negatively affecting user satisfaction[29].

Technological limitations also affect app usage. Slow internet connections, older devices with low hardware capacity, or users with low digital literacy can restrict effective use of the applications[37]. Additionally, due to the health data collected by these apps, users express concerns about data privacy and security. The possibility of personal health information being accessed or misused by unauthorized parties heightens users' sensitivity toward security[19].

All these limitations may cause mobile sports applications to fall short of fully meeting user expectations. Nevertheless, advances in technology, AI-powered personalization systems, and more user-friendly designs hold the potential to mitigate these problems and improve the user experience.

Pricing Models of Mobile Sports Applications

The pricing strategies adopted in mobile sports applications vary according to the content, services, and features offered. Prices can range from symbolic amounts (1 cent) up to 100 dollars (5). Common pricing models can be summarized as follows:

1. Free Model: Many applications offer basic exercise and nutrition content completely free of charge. However, advanced features are usually made available through payment.

2. Freemium Model: The core functions of the app are offered for free, while access to additional content and advanced features requires a subscription or one-time payment.

3. Subscription-Based Model: Premium content, personalized services, and exclusive programs are provided in exchange for monthly, quarterly, or annual fees.

4. Content-Based Sales: Some apps allow users to purchase specific exercise videos, diet plans, or training programs through one-time payments.

5. Ad-Based Model: Applications are offered free of charge but display advertisements during content usage. Revenue is generated through ad impressions.

Each application may have a distinct pricing policy. Therefore, it is important for users to carefully evaluate the services offered and pricing conditions before selecting an app that suits their individual needs.

The Relationship Between Personal Income and Mobile Fitness Applications

As the impact of mobile fitness applications on individuals' exercise habits and health management continues to grow, socioeconomic factors influencing the adoption of these applications have also become a focus of research. In the study titled "*Factors Affecting the Adoption of Mobile Fitness Applications*" published in the IEEE Xplore database, A wide range of variables influencing mobile application usage have been examined, with particular attention given to the role of economic status in this process[38].

According to the research findings, individuals' perceived financial resources can directly influence their intention to use mobile fitness applications as well as their actual usage levels. It was observed that individuals with higher income levels tend to have a greater inclination to access premium features and invest in paid content. This tendency can increase the use of services such as personalized training programs, advanced performance tracking, and expert support.

Conversely, individuals in lower income groups are thought to prefer applications that are free or limited to basic content. However, some studies emphasize that income level alone is not the sole determinant[38]. Other factors such as the perceived benefits of the application, ease of use, effectiveness in achieving health goals, and the degree of social interaction also play critical roles in the adoption of applications. Therefore, while economic status is an important factor affecting access to and usage patterns of mobile fitness applications, individual motivation and needs are equally decisive.

Most Popular Mobile Sports and Fitness Applications Worldwide

Nike Training Club: Nike Training Club is a popular mobile sports application offering various workout programs, training videos, and personalized exercise plans.

MyFitnessPal: MyFitnessPal helps users track their nutrition, calculate calories, and monitor their dietary goals.

Strava: Strava is a widely used sports tracking app for running, cycling, swimming, and other outdoor activities. Users can track their workouts, record routes, and interact with other athletes.

Fitbit: Fitbit is a combination of a fitness tracking device and an app that enables users to monitor their activity levels, sleep quality, and health goals.

Runtastic: Runtastic assists users in tracking and recording running, cycling, walking, and other exercises. Users can set goals, monitor progress, and share their workouts.

7 Minute Workout: 7 Minute Workout is a popular sports app that offers short, high-intensity workout programs, allowing users to improve their fitness levels in a brief period.

In addition to these apps, Under Armour has acquired MapMyRun and Endomondo, while Asics purchased Runkeeper and Adidas acquired Runtastic[39]. Other widely used mobile sports and fitness apps globally include Fitbod, StrongLifts 5x5, Couch to 5K, MapMyFitness, and Peloton. However, it is important to note that popularity can vary depending on regional differences, user preferences, and market trends. For example, apps such as Mirror, Zwift, iFit, and NordicTrack represent a new emerging trend in online home training for exercise and entertainment purposes[24].

Contributions of Mobile Sports and Health Applications to Countries' Health Systems

Mobile health (m-health) applications provide valuable data for understanding user behaviors, thereby contributing to addressing medical resource shortages and reducing healthcare costs[40]. The widespread adoption of smart devices enables these devices to offer suitable infrastructure for e-health applications and enhances the effectiveness of mobile health systems[41].

The impact of mobile health and sports applications on healthcare expenditures varies between countries and studies. A study conducted in Malaysia found that medical students had positive awareness and attitudes toward mobile health applications, yet usage rates remained relatively low. This indicates a need for increased focus on m-health topics in medical education and addressing barriers to application use[42].

Mobile health applications hold particular potential in helping individuals with chronic diseases monitor and manage their health conditions. Features such as medication reminders, nutrition plans, and health data tracking enable more informed disease management[24]. Consequently, hospital visits and treatment costs can be reduced.

Furthermore, mobile health applications facilitate access to remote healthcare services, supporting diagnostic and treatment processes. Through telehealth systems, individuals can conduct online consultations with doctors, receive medical advice, and perform some basic health tests independently[24]. This reduces the need to visit healthcare facilities for non-urgent issues and has positive effects on overall healthcare expenditures.

In some countries, insurance models have been developed to encourage the use of mobile health applications. Insurance companies incentivize individuals to monitor their health through these apps by offering premium discounts or special insurance benefits to users who achieve certain health goals. This approach not only raises individual health awareness but also contributes to the wider adoption of preventive healthcare services at the societal level.

WHO and EU Activities in the Field of Mobile Health

The European Union (EU) supports the use of information and communication technologies in health and urban services and promotes the widespread adoption of digital solutions in line with sustainable development goals[43]. Within this framework, various reports and policy documents related to mobile health and sports applications have been prepared, and numerous initiatives supporting the adoption of digital health technologies have been implemented.

The Digital Health Movement initiated by the EU aims to digitalize cross-border health services and ensure interoperability between countries. This initiative particularly addresses key elements such as data security, user privacy, and integration with national systems within the scope of mobile health applications.

The EU's eHealth Action Plan 2019–2022 aims to increase the use of mobile health technologies, protect patient rights, and ensure the secure sharing of health data. In line with this plan, strengthening digital infrastructures for cross-border data sharing is targeted. These efforts are also carried out in collaboration with the World Health Organization (WHO)[44].

The World Health Organization assigns global importance to digital health technologies and supports the role of mobile applications in areas such as healthcare access, information dissemination, disease monitoring, and management[44]. Accordingly, EU policies not only promote the development of digital health applications at the regional level but also encourage their advancement through international cooperation.

Discussion

The sustainable use of mobile fitness applications is influenced by various motivational and structural factors. Achievement motivation is highlighted as a primary driving force for users, while social interaction, exercise desire, economic factors, and interest in the application are also noted to shape user behavior[45]. However, intrinsic motivations, such as self-improvement and emotional satisfaction, appear to have limited influence during the initial stages of use. In this context, not only functionality but also emotional attachment and hedonic experiences play a critical role in maintaining user engagement.

Studies on older adults indicate that mobile fitness applications positively affect physical activity levels and mood, though sufficient evidence is lacking regarding cognitive and social outcomes[46]. This highlights the need for applications specifically designed for elderly users. It has been shown that these technologies can be integrated into educational systems to support movement-based learning among children[47].

Fitness applications produce multidimensional outcomes beyond individual health, including social interaction and subjective well-being[48,49]. Notably, among university students, perceived health status and exercise habits are positively associated with subjective well-being.

In the context of the Technology Acceptance Model (TAM), cognitive variables such as performance expectancy, effort expectancy, and social influence are found to be decisive factors in the adoption of these applications from the users' perspective[50]. Furthermore, information quality and interaction levels enhance user satisfaction and application loyalty, supporting word-of-mouth (WOM) promotion and continued usage[51].

Among individuals with poor health status, hedonic motivation has been identified as one of the strongest predictors of usage intention[52]. Additionally, social comparisons made through social media have been shown to increase motivation and strengthen user engagement with applications[53].

Recent years have seen a significant increase in academic publications on mobile fitness applications[54]. Data from the 2024 ACSM report underscore the ongoing global transformation in this field and emphasize the need for fitness professionals to adapt accordingly[55].

Moreover, Internet of Things (IoT)-based technologies and artificial intelligence-supported systems have been reported to enhance user experience, offering strategic advantages particularly in training tracking, data analysis, and personalization[56,57]. These technologies enable effective performance management through real-time feedback mechanisms. Additionally, personalized mobile interventions have demonstrated small yet significant effects on lifestyle behavior change, with increased efficacy when technical content components are carefully considered[58].

Conclusion

In conclusion, the mobile sports application market is poised for significant growth in the future. Companies and content creators that effectively analyze and address the needs of this market are

expected to provide long-term services. Additionally, efforts to integrate these applications into national infrastructures are ongoing. Developed countries, in particular, are striving to reduce healthcare expenditures and establish innovative health approaches. Physical inactivity, identified as a major contributor to obesity and chronic diseases, has become a pressing concern. The increasing challenges caused by sedentary lifestyles are motivating all stakeholders—especially international and national organizations—to seek innovative solutions.

The integration of mobile fitness applications into the healthcare sector can offer users a holistic health monitoring experience. Physicians can simultaneously track exercise data alongside health metrics such as heart rate and sleep patterns. This dual monitoring enables users to evaluate both their physical performance and overall health status. For instance, a mobile sports application could integrate a user's exercise data with electronic health records, providing healthcare providers with a more comprehensive view. Such integration can facilitate more accurate diagnoses and expedite treatment processes. Faster diagnosis and treatment methods can contribute significantly to reducing healthcare costs, which remain a major challenge in both developed and developing countries.

Healthcare providers have the opportunity to transform how they discuss health and fitness with their patients. Instead of providing general recommendations—such as exercising at least 30 minutes five days a week—providers could develop personalized exercise regimens based on individual health data and feedback from fitness applications and wearable devices[24]. Moreover, individuals must plan their exercise schedules according to traditional constraints of time and place. Users can be encouraged to utilize wearable technologies capable of uploading data to applications such as Strava or Garmin Connect, allowing them to track their progress and connect with friends.

To meet the diverse and evolving needs of current and future consumers, providers of all types of physical activity must reconsider their offerings from a broader socio-economic perspective. Therefore, strategic evaluations regarding the accessible and flexible supply of leisure opportunities related to sports are necessary. This also calls for flexible organizational structures and a clearer understanding of current trends in leisure activities, which will inform policymakers and decision-makers. Such efforts may lead to further research directions in this field.

User ratings for mobile sports applications generally serve as an indicator of usability, performance, and overall user experience. Users commonly rate and review applications on app stores (e.g., App Store or Google Play Store), providing potential users with insights into app quality and functionality[19]. These applications typically offer users the ability to track their progress and monitor achievements toward their goals. Additionally, interaction within in-app communities can provide support and enhance motivation.

Since mobile sports applications provide a platform accessible from anywhere, they hold promising potential in the global market[59]. Recent studies have shown that applications responding to user expectations and offering accurate feedback tend to have higher usage rates[60]. Furthermore, multilingual support in applications can facilitate targeting users in diverse geographic regions. The low cost and easy accessibility of mobile sports applications may also enable them to reach a more informed user base. It is anticipated that future developments, particularly with emerging technologies such as virtual reality, will further advance these applications.

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