

## Impact of Digital Fitness Application Use on Mental Health of High School Students in Jordan

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### **Abstract**

This study interrogates the transformative potential of digital fitness applications on the mental health of Jordanian high-school students. Its primary objectives were to elucidate the motivations driving app adoption, quantify the association between recorded and actual physical-activity intensity and psychological well-being, and evaluate the moderating roles of app features and virtual community engagement. Employing a descriptive quantitative methodology, data were gathered via a rigorously validated, Likert-scale questionnaire administered to 380 students in Irbid, with reliability coefficients (Cronbach's  $\alpha$ ) exceeding 0.80 across all subscales. Key findings reveal that personalized workout plans and peer-support networks underpin app use, while recorded moderate-to-vigorous activity most strongly predicts reductions in anxiety and perceived stress. Actual increases in physical activity translated into enhanced concentration and relaxation, and progress-tracking dashboards emerged as the most potent adherence catalyst. Virtual community interactions yielded moderate gains in belonging and mood, with informal peer exchanges outpacing formal forums. Collectively, these insights underscore the imperative of integrating adaptive personalization, clear feedback loops, and social affordances to optimize digital interventions for adolescent mental-health resilience.

**Keywords:** *Digital Fitness Applications, Adolescent Mental Health, Physical Activity Intensity, Health Interventions*

### **1. Introduction**

Adolescence represents a formative epoch marked by rapid neurobiological, psychosocial, and emotional transformations. High school students in Jordan are exposed to school-related stress, social

adjustments as well as self identities, all of which may lead to increased vulnerability to anxiety, depression and perceived levels of stress. Simultaneously, a large number of digital fitness apps have exploded into existence on the back of ubiquity of smartphones, which aim to monitor, motivate, and mediate physical activity. The growing area of digital phenotyping using proactive and passive data on sensors suggests that they can be used both as adjuncts to interventions and diagnoses of mental health (Balasundaram et al., 2025). Additionally, both qualitative and quantitative research on eHealth tools emphasize the potential of personalized mobile applications in generating positive health behavior among teens, thus conceptually building a basis to bring mental health outcomes to the research environment of adolescents in context (Benavides et al., 2024).

Digital fitness applications are the types of mHealth technology that incorporate behavior change strategies, including type goal setting, self monitoring, and feedback, to encourage prolonged use (Conroy, Yang, & Maher, 2014). These interventions were summarized during the previous decade in scoping reviews, which confirmed moderate effect sizes in their role of increasing the overall physical activity but bemoaned a lack of design common denominators and internal diversity in measurement (Domin et al., 2021). Systematic meta-analyses further reveal that smartphone-based interventions can yield statistically significant, albeit modest, improvements in step counts and moderate-to-vigorous physical-activity minutes (He et al., 2021; Direito, Carraça, Rawstorn, Whittaker, & Maddison, 2017). Yet, these reviews seldom disaggregate mental-health endpoints, leaving an evidentiary lacuna at the nexus of physical-activity intensity and psychological well-being.

Exergaming investigations—where play mechanisms require physical exertion—have demonstrated gains in executive function and affective regulation among neurodiverse youth. For instance, a randomized clinical trial involving children with ADHD reported improvements in working memory and inhibitory control following cognitively demanding exergame sessions (Benzing & Schmidt, 2017). Similarly, acute bouts of exergaming produced transient enhancements in executive functioning, suggesting dose-dependent relationships between physical exertion and cognitive-affective modulation (Benzing, Chang, & Schmidt, 2018). During the COVID-19 quarantine, exergames emerged as accessible coping strategies for anxiety management, illustrating the psychosocial affordances of interactive fitness platforms under conditions of social isolation (Borges Viana & Barbosa de Lira, 2020).

Pragmatic randomized trials—such as the AIMFIT study—have operationalized behavior-change frameworks within commercial fitness apps to increase self-reported exercise frequency. These trials attest to the utility of push-notifications and personalized feedback loops, yet they seldom evaluate downstream mental-health metrics (Direito, Jiang, Whittaker, & Maddison, 2015). Umbrella reviews of eHealth and mHealth interventions corroborate the necessity of multi-component designs, coupling nutritional guidance with physical-activity modules to optimize holistic well-being (Fiedler, Eckert, Wunsch, & Woll, 2020). Despite these advances, the literature remains skewed toward quantitative activity outcomes, with scant attention to affective trajectories or contextually moderated effects in Middle Eastern educational settings.

Artificial intelligence-informed mental-health applications exemplify an emergent frontier in which predictive analytics and stakeholder co-design converge. A mixed-methods exploration revealed that AI-embedded apps could deliver adaptive coping strategies for young users, contingent upon user-experience factors and perceived credibility (Götzl et al., 2022). Parallely, feasibility studies employing machine learning on passive smartphone data have signaled promising avenues for early detection of mental-health risk, underscoring the imperative to integrate user engagement data with clinically validated scales (Balasundaram et al., 2025; Jiang & Yang, 2025).

## 1.1. Research Gap

Although extant research elucidates the capacity of digital fitness applications to bolster physical-activity metrics and, by extension, cognitive and emotional regulation, several lacunae persist. First, the majority of studies originate from Western or East Asian contexts (e.g., Direito et al., 2017; He et al., 2021), thereby limiting generalizability to Arab adolescents whose cultural norms, educational pressures, and technological affordances diverge substantially. Second, while exergaming trials highlight executive-function benefits (Benzing & Schmidt, 2017), few investigations systematically quantify changes in established mental-health indicators—such as anxiety, depression, and perceived stress—within school-based populations. Third, theoretical models have seldom reconciled the triadic interplay of app-recorded activity intensity, actual physical-activity increases, and user-experience dimensions in predicting mental-health outcomes. Finally, the moderating roles of app features—such as motivational reminders—and virtual community engagement remain underexplored, particularly in regions where social support structures may uniquely inform digital intervention efficacy (Borges Viana & Barbosa de Lira, 2020; Götzl et al., 2022).

## 1.2. Research Questions

To address these gaps, this study examines the nuanced mechanisms through which digital fitness application use influences mental-health outcomes among high school students in Jordan. The specific research questions guiding this inquiry are:

1. Why do Jordanian high school students use digital fitness apps?
2. What digital fitness apps do Jordanian high school students use to improve their mental health?
3. What is the impact of using digital fitness apps on improving mental health (levels of anxiety, depression, and stress) among Jordanian high school students?
4. To what extent does the intensity of physical activity recorded in the app (e.g., minutes of moderate to vigorous activity) predict changes in mental health indicators among secondary school students?
5. What is the impact of the actual increase in physical activity levels resulting from engaging in these apps on improving mental health among Jordanian high school students?
6. How do app features (e.g., types of exercises available, motivational reminders, and goal tracking) affect exercise adherence rates and mental health outcomes?
7. To what extent does interacting with the virtual community within the app (e.g., user groups and forums) enhance students' mental health?

## 1.3. Significance of the Study

By interrogating these questions within the Jordanian milieu, the present study not only extends extant theoretical frameworks on behavior-change technologies (Conroy et al., 2014; Direito et al., 2015) but also delivers empirically grounded insights for educators, policymakers, and app developers. In doing so, it aims to delineate culturally salient pathways to optimize digital fitness interventions, thereby contributing to the broader discourse on adolescent mental-health promotion in the digital era.

## 2. Literature Review

The burgeoning field of digital health interventions has witnessed an unprecedented proliferation of mobile applications designed to promote physical activity, yet their capacity to engender sustained improvements in both somatic and psychological well-being remains contested. Among adolescents—a demographic undergoing rapid biopsychosocial maturation—the stakes are particularly high, as early

habits of sedentary behavior can precipitate chronic health conditions and exacerbate mental-health vulnerabilities. A randomized controlled trial examining a multifaceted mobile application for youth with obesity demonstrated significant reductions in body mass index and concomitant enhancements in healthy eating habits and quality of life (Likhitweerawong et al., 2021). These results suggest that mobile technologies have the potential to penetrate beyond the step counting into other aspects of the lifestyle, but the specific ways through which this is achieved could use some additional explanation.

The use of behavior-change techniques that enhance self-efficacy, overcome inhibitors, and trigger goal pursuit is at the center of the conversation on app efficacy. By the use of the moderated mediation model, Litman et al. (2015) demonstrated that mobile exercise apps increase the level of the leisure-time physical activity through the increase of the user confidence level regarding surmounting the barriers. Their analysis highlighted that engagement in the apps shades into real-world benefits through the accepted medium of barrier reduction through custom prompts and feedback loops. In addition to this, Liu et al. (2021) used Social Cognitive Theory on a cross-sectional sample of Chinese adolescents and discovered that the prediction of levels of physical-activity were observed in observational learning, expectations of outcome, and self-regulatory ability. The two studies, in sum, explain a psychosocial scaffolding that includes motivational, cognitive, and environmental contingencies through which digital interventions have an effect.

Still, adolescents do not represent a single group; gender and developmental stage is of vital importance in shaping intervention responsiveness. In a randomized study across secondary school age groups, Mateo Orcajada and Vaquero Cristobal (2023) have exposed that gender and academic year were important moderators of the effectiveness of a mobile application intended to enhance activity prices, with male subjects and those in lowers grades displaying more pronounced adoption rates. In a related study, these authors required step-tracker app usage during after-school hours, with equal results in physical fitness and body structure gains observed in all the participants, yet gender difference patterns in adherence were pointed out depending on gender norms and curriculum needs (Mateo Orcajada et al., 2023). These observations set the necessity of matching digital interventions to sociocultural outlines and temporal patterns of the adolescent life to the forefront.

On top of individual traits, application architecture or down to a social ecosystems woven through can exaggerate or mitigate results. In the study by Mittmann et al. (2022), LINA is a social augmented-reality game offered in headsets to early adolescents that allowed them to connect in the real world with each other, creating a sense of belonging and peer support. In their mixed methods assessment, in-game communal challenges and real-time feedback contributed towards building resilience against mood disturbances to a greater extent such that virtual socialization may resolve out-of-the-screen to support psychological capital. Similar to this study, Ridgers et al. (2021) examined the use of commercial wearables combined with digital behavior-change resources in schools operating in socioeconomically disadvantaged communities and concluded that combination objective activity tracking with community-based challenges induced higher levels of participation than monitoring alone. Incorporation of social affordances, therefore, rises as an outstanding course of action design considering the maximising available engagement and psycho social gain.

The nature of physical activity itself, be it conventional exercises or exergaming, adds to the variety of the effects of the intervention. In a meta-analysis of trials using active video-games, Stanmore et al. (2017) reported beneficial moderate improvements in cognitive performance in both clinical and non-clinical samples, confirming the neurocognitive returns of physically stimulating gameplay. The same results were also supported by Staiano et al. (2022) using a pediatric sample and proved the influence of specifically designed mHealth intervention focusing on motor skills enhancement, not only on the aspects of improving coordination but also on stress parameters reduction. In the meantime,

Stasinaki et al. (2021) found that a new mobile health platform demonstrated similar benefits (body mass index and stress markers decline) to a multi-component behavior-change program that used interventions in adolescents with obesity but proved scalable. Taken together, these studies provide testimony to the multi-purpose potential of modalities of activity, whether algorithmically individualised training regimens or enveloping games, to generate both physiological and emotional improvements.

Trials over the last several years have moved beyond efficacy to effectiveness paradigms, and explore real world applicability, as well as adherence over the long term. Tugault Laflleur et al. (2023) assessed the Aim2Be intervention, which was a hybrid human-coached and digital program, having observed sustained lifestyle behavior modification in adolescents with overweight and obesity. Significantly, they noted that their work supported the mediational position of incremental daily activity increases (which were logged in app) driving mental health improvement, which align with the proposed mediation models formulated by White et al. in their systematic review of physical activity-mental health associations (White et al., 2024). These evidence points toward the idea that the proximal provider of psychological advantage is action and not just activity on the app.

Artificial intelligence and machine-learning algorithms represent the next step of precision digital health. A study conducted by Oh et al. ( ) tested the efficiency of AI-based interactive home exercise apps in adolescents with obesity demonstrating that adaptive exercise programs whose regimens were adjusted in real-time based on the performance indicators of the participant recorded better results in both physical health and emotional well-being than fixed ones. Peuters et al. (2024) furthered this exploratory assumption through an experimental assessment of a mobile healthy life intervention, revealing the positive influence of AI-driven personalization on satisfaction rates and more profound considerations of current health-related issues, resulting in an improved mental-health rate in comparison to other pedagogical approaches.

However, the interconnection between cognitive-affective predicates and academic functioning deserves to be noticed because mental-health interventions can also provide tertiary effects in school settings. Recent research lead by Morales Vives, Camps, and Due n a (2020) showed that maturity, intelligence, and personality features all predict academic success in adolescents, so in a sense there is an unmediated relationship between digital interventions that reinforce a sense of self-regulation and self-efficacy and an advantageous academic journey. Moreover, Yang and Van Stee's (2019) meta-analytic review of mobile-phone interventions across health outcomes revealed that multi-modal engagement strategies—combining push-notifications, peer support, and self-monitoring—produce the most robust effect sizes, a principle readily translatable to scholastic motivation and performance metrics.

Yet, pervasive heterogeneity in study designs, outcome measures, and cultural contexts constrains the extrapolation of these findings to Middle Eastern adolescent cohorts. Schoeppe et al. (2017) critiqued the uneven quality and feature sets of apps targeting youth health behaviors, calling for standardized evaluation frameworks. Seah and Koh (2020) similarly reported that weekend-focused mobile interventions yielded disparate effects across demographic strata, highlighting the salience of contextual tailoring. Consequently, there remains an exigent need to synthesize behavior-change theories, technological affordances, and cultural sensibilities into cohesive digital strategies that resonate with Jordanian high school students.

In sum, the extant literature illuminates the multifaceted pathways through which mobile health technologies influence adolescent physical and mental well-being. Effective interventions deploy a convergence of behavior-change techniques, tailored content, social engagement, and adaptive algorithms to catalyze sustained activity and psychological resilience. Moderators such as gender, academic year, and socioeconomic backdrop, as well as mediators including self-efficacy and actual activity increments,



determine the magnitude and durability of outcomes. Yet, the predominance of research in Western and East Asian contexts, coupled with methodological variability, underscores the imperative for culturally grounded investigations. This review thus frames the present study's objective: to elucidate how digital fitness application use—across motivational antecedents, feature sets, and community dynamics—translates into mental-health improvements among Jordanian high school students, thereby bridging critical gaps in both theory and practice.

### **3. Methodology**

#### **3.1. Research Design**

This study employs a descriptive quantitative design to systematically characterize patterns of digital fitness application use and their associations with mental-health indicators among Jordanian high school students. By measuring variables in their natural setting, the descriptive approach enables precise estimation of frequencies, durations, intensities, and inter-relationships of app usage and psychological outcomes, without experimental manipulation of independent variables (Creswell, 2014).

#### **3.2. Population and Sample**

The study population comprises all students enrolled in public and private secondary schools throughout the Hashemite Kingdom of Jordan. From this population, a convenience sample of 380 male and female students in grades 10–12 was drawn from schools in Irbid Governorate. Selection criteria required that participants be active users of at least one digital fitness application, ensuring that the sample reflects those directly experiencing the phenomena under investigation.

#### **3.3. Study Instrument**

Data were collected via a self-administered questionnaire specifically developed to align with the study's objectives. The instrument includes six subscales—usage frequency, usage duration, physical-activity intensity, application features, virtual community engagement, and mental-health outcomes—each measured by items on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). This structure guarantees comprehensive coverage of all constructs relevant to the research questions.

#### **3.4. Validity and Reliability**

To establish content validity, the draft questionnaire was reviewed by a panel of five experts in adolescent psychology, digital health technologies, and quantitative methods, whose feedback informed item refinement for clarity and relevance. Internal consistency was assessed using Cronbach's alpha for each subscale; all values exceed the 0.70 threshold, confirming satisfactory reliability for the instrument (see Table 1).

**Table 1. Cronbach's Alpha Coefficients for Questionnaire Subscales**

axis	Number of Items	Cronbach's $\alpha$
Reasons for high school students in Jordan to use digital fitness apps	8	.82
The impact of using digital fitness apps on improving mental health (levels of anxiety, depression, and stress) among secondary school students in Jordan	8	.89
The extent to which physical activity intensity recorded in the app (e.g., minutes of moderate to vigorous activity) predicts changes in mental health indicators among secondary school students	8	.95
The impact of actual increases in physical activity levels resulting from the use of these apps on improving the mental health of secondary school students in Jordan	8	.88
The impact of app features (such as available exercise types, motivational reminders, and goal tracking) on exercise adherence rates and mental health outcomes	8	.92
The extent to which interaction with the virtual community within the application (such as user groups and forums) enhances students' mental health	8	.90

## 4. Results

### 4.1. Demographic Data

**Table 2. Demographic Data of Respondents**

Variable	Category	Frequency	Percentage (%)
Gender	Male	189	49.74
Gender	Female	191	50.26
Grade	10th	142	37.37
Grade	11th	125	32.89
Grade	12th	113	29.74
Total	All	380	100.00

As shown in Table 2, the demographic composition of the sample is both balanced and diverse. In terms of gender, the respondents are almost equally split, with females representing 50.26 % ( $n = 191$ ) and males 49.74 % ( $n = 189$ ). This near parity suggests that any gender-related patterns in app usage or mental-health outcomes will not be unduly influenced by overrepresentation of one gender group.

Regarding academic grade, the largest cohort consists of 10th-grade students (37.37 %,  $n = 142$ ), followed by 11th-graders (32.89 %,  $n = 125$ ) and 12th-graders (29.74 %,  $n = 113$ ). The higher proportion of younger high-schoolers may reflect greater extracurricular technology engagement among this subpopulation, which could influence both their familiarity with fitness apps and their responsiveness to digital interventions. Overall, the sample's distribution across gender and grade levels affords a robust basis for exploring the study's research questions in a way that generalizes across the full spectrum of Jordanian high-school students.

#### 4.2. Study data analysis

**Table 3. Reasons for Using Digital Fitness Apps**

Reason	Mean	SD	Agreement Level
<b>I use digital fitness apps to track my daily physical activity levels.</b>	2.97	1.44	Medium
<b>I use digital fitness apps to set and achieve personal fitness goals.</b>	2.96	1.42	Medium
<b>I use digital fitness apps to receive motivation and reminders for exercising regularly.</b>	3.01	1.42	Medium
<b>I use digital fitness apps to manage stress and improve my mental well-being.</b>	3.03	1.44	Medium
<b>I use digital fitness apps to access personalized workout plans tailored to my needs.</b>	3.10	1.42	High
<b>I use digital fitness apps to monitor my progress and improvements in health over time.</b>	3.01	1.40	Medium
<b>I use digital fitness apps to connect with peers and participate in online fitness communities.</b>	3.07	1.42	High
<b>I use digital fitness apps because they are convenient and engaging to use.</b>	3.00	1.42	Medium

It is evident from Table 3, which presents the reasons high school students in Jordan use digital fitness applications, that the overall mean across all eight items was 3.02 (SD = 1.42), indicating a medium level of agreement. Among the individual items, the most strongly endorsed reason was “I use digital fitness apps to access personalized workout plans tailored to my needs,” which achieved a mean of 3.10 (SD = 1.42), reflecting a high level of agreement. A close second was “I use digital fitness apps to connect with peers and participate in online fitness communities,” with a mean of 3.07 (SD = 1.42), also classified as high agreement.

Following these, the reasons “I use digital fitness apps to manage stress and improve my mental well-being” (Mean = 3.03, SD = 1.44) and “I use digital fitness apps to receive motivation and reminders for exercising regularly” (Mean = 3.01, SD = 1.42) registered medium agreement levels. The least endorsed items—“I use digital fitness apps to set and achieve personal fitness goals” (Mean = 2.96, SD = 1.42) and “I use digital fitness apps to track my daily physical activity levels” (Mean = 2.97, SD = 1.44)—likewise fell into the medium category. These findings suggest that while personalization and social engagement features drive stronger approval among students, goal setting and self-monitoring, though still moderately valued, are relatively less motivating.

**Table 4. Digital Fitness Apps Usage**

App	Frequency	Percentage (%)
MyFitnessPal	137	36.05
Nike Training Club	156	41.05
Fitbit (App & Companion Devices)	154	40.53
Strava	161	42.37



App	Frequency	Percentage (%)
SworKit	162	42.63
Seven – 7 Minute Workout	149	39.21
Home Workout – No Equipment	137	36.05
FitOn	164	43.16
<b>Total</b>	<b>380</b>	<b>100.00</b>

It is apparent from Table 4, which displays the digital fitness applications used by Jordanian high school students to improve their mental health—and respondents were allowed to select multiple options—that FitOn is the most commonly used app (164 students, 43.16 %), followed closely by SworKit (162, 42.63 %) and Strava (161, 42.37 %). Nike Training Club (156, 41.05 %) and Fitbit (154, 40.53 %) are also widely adopted. Conversely, MyFitnessPal and Home Workout – No Equipment each register moderate usage (137, 36.05 %), while Seven – 7 Minute Workout shows slightly lower uptake (149, 39.21 %). Overall, the total sample size of 380 students (100 %) provides a comprehensive overview of app preferences within this cohort.

**Table 5. Impact of Using Digital Fitness Apps on Improving Mental Health**

Statement	Mean	SD	Agreement Level
Using digital fitness apps reduces my feelings of anxiety.	3.05	1.40	High
Using digital fitness apps alleviates symptoms of depression.	2.92	1.42	Medium
Regular engagement with digital fitness apps decreases my perceived stress.	2.97	1.39	Medium
Using digital fitness apps improves my overall mood.	2.95	1.39	Medium
Digital fitness apps help me cope better with academic and social pressures.	2.93	1.46	Medium
Using digital fitness apps enhances my self-esteem and sense of confidence.	2.89	1.42	Medium
Engagement with digital fitness apps promotes better sleep quality, which benefits my mental health.	2.88	1.43	Medium
Regular use of digital fitness apps fosters a sense of relaxation and calm.	2.93	1.50	Medium

It is evident from Table 5, which presents the impact of using digital fitness applications on improving mental health among Jordanian high school students, that the overall mean across all eight items was 2.94 (SD = 1.43), indicating a medium level of agreement. Among the individual statements, the most strongly endorsed item was “Using digital fitness apps reduces my feelings of anxiety,” which recorded a mean of 3.05 (SD = 1.40), reflecting a high level of agreement. This was followed by “Regular engagement with digital fitness apps decreases my perceived stress,” with a mean of 2.97 (SD = 1.39), and “Using digital fitness apps improves my overall mood,” which achieved a mean of 2.95 (SD = 1.39), both classified as medium levels of agreement. Conversely, the lowest endorsement emerged for “Engagement with digital fitness apps promotes better sleep quality, which benefits my mental health,” with a mean of 2.88 (SD = 1.43), also within the medium agreement range. These findings suggest that

while anxiety reduction is the primary perceived benefit, students also recognize moderate improvements in stress management and mood, whereas sleep-related benefits are perceived somewhat less strongly.

**Table 6. Activity Intensity Predicting Mental Health Changes (n = 380)**

Statement	Mean	SD	Agreement Level
The minutes of moderate-to-vigorous activity recorded by the app correspond to noticeable reductions in my anxiety levels.	3.05	1.41	High
Higher intensity activity logged by the app is associated with a decrease in my feelings of depression.	2.99	1.40	Medium
Increased time spent in moderate-to-vigorous exercise as recorded in the app predicts lower levels of perceived stress.	3.20	1.43	High
The app's recorded data on vigorous activity intensity corresponds to improvements in my overall mood.	3.10	1.39	High
Greater minutes of high-intensity physical activity logged by the app predict enhanced self-esteem.	3.00	1.46	Medium
The intensity of my recorded workouts in the app corresponds to improved sleep quality, benefiting my mental health.	3.13	1.41	High
More moderate-to-vigorous activity minutes documented by the app are linked to increased feelings of calm and relaxation.	3.01	1.39	Medium
Higher levels of activity intensity recorded by the app predict better concentration and reduced irritability.	2.97	1.44	Medium

It is clear from Table 6, which presents how the intensity of physical activity recorded in the app predicts changes in mental-health indicators among Jordanian high-school students, that the overall mean across the eight statements was 3.06 (SD = 1.42), indicating a medium level of agreement. The highest endorsement emerged for “Increased time spent in moderate-to-vigorous exercise as recorded in the app predicts lower levels of perceived stress,” which achieved a mean of 3.20 (SD = 1.43), reflecting a high agreement level. This was followed by “The app’s recorded data on vigorous activity intensity corresponds to improvements in my overall mood,” with a mean of 3.10 (SD = 1.39), also classified as high agreement, and “The intensity of my recorded workouts in the app corresponds to improved sleep quality, benefiting my mental health,” with a mean of 3.13 (SD = 1.41), likewise rated high. Conversely, the statement “Higher levels of activity intensity recorded by the app predict better concentration and reduced irritability,” with a mean of 2.97 (SD = 1.44), registered the lowest agreement level, though still within the medium range. These results suggest that students perceive stronger anxiety and stress reductions tied to app-recorded activity intensity, while cognitive-focus benefits are viewed as somewhat more moderate.

**Table 7. Impact of Actual Increases in Physical Activity on Mental Health**

Statement	Mean	SD	Agreement Level
The actual increase in my physical activity levels resulting from engaging with digital fitness apps has reduced my anxiety.	3.01	1.40	Medium
The actual increase in my physical activity levels resulting from engaging with digital fitness apps has decreased my depressive symptoms.	2.90	1.43	Medium
The actual increase in my physical activity levels resulting from engaging with digital fitness apps has lowered my perceived stress.	3.02	1.38	Medium
The actual increase in my physical activity levels resulting from engaging with digital fitness apps has enhanced my overall mood.	3.03	1.39	Medium
The actual increase in my physical activity levels resulting from engaging with digital fitness apps has improved my self-esteem.	3.02	1.44	Medium
The actual increase in my physical activity levels resulting from engaging with digital fitness apps has sharpened my concentration and focus.	3.14	1.44	High
The actual increase in my physical activity levels resulting from engaging with digital fitness apps has improved my sleep quality, which benefits my mental health.	2.81	1.40	Medium
The actual increase in my physical activity levels resulting from engaging with digital fitness apps has fostered a greater sense of relaxation and calm.	3.08	1.44	High

It is evident from Table 7, which presents the impact of actual increases in physical activity resulting from app engagement on students' mental health, that the overall mean across all eight items was 3.00 (SD = 1.42), indicating a medium level of agreement. Among the individual statements, the most strongly endorsed was "The actual increase in my physical activity levels resulting from engaging with digital fitness apps has sharpened my concentration and focus," which recorded a mean of 3.14 (SD = 1.44), reflecting a high agreement level. Close behind was "The actual increase in my physical activity levels resulting from engaging with digital fitness apps has fostered a greater sense of relaxation and calm," with a mean of 3.08 (SD = 1.44), also indicating high agreement.

The remaining items—all within the medium agreement range—highlight that students perceive tangible reductions in anxiety (M = 3.01, SD = 1.40), stress (M = 3.02, SD = 1.38), and depressive symptoms (M = 2.90, SD = 1.43), alongside moderate improvements in mood (M = 3.03, SD = 1.39), self-esteem (M = 3.02, SD = 1.44), and sleep quality (M = 2.81, SD = 1.40). These findings underscore that actual behavioral enactment—rather than mere app interaction—translates into meaningful mental-health benefits, particularly in cognitive and relaxation domains.

**Table 8. Impact of App Features on Exercise Adherence and Mental Health**

Statement	Mean	SD	Agreement Level
The variety of exercise types available in the app enhances my adherence to workout routines.	2.98	1.42	Medium
The motivational reminders sent by the app encourage me to maintain consistent exercise habits.	2.98	1.41	Medium
The goal-tracking feature in the app motivates me to complete my planned workouts.	2.95	1.41	Medium
The app's personalized exercise programs improve my commitment to regular physical activity.	2.92	1.38	Medium
The diversity of workout options provided by the app contributes positively to my mental well-being.	2.98	1.44	Medium
The app's motivational notifications help reduce my perceived stress levels.	2.93	1.37	Medium
The app's progress-tracking dashboards increase my confidence in achieving my fitness goals.	3.06	1.46	High
The app's structured goal-setting and feedback mechanisms enhance my mood and psychological resilience.	3.02	1.43	Medium

It is apparent from Table 8, which examines how specific application features influence exercise adherence and mental health among Jordanian high school students, that the overall mean across all eight statements was 2.99 (SD = 1.41), indicating a medium level of agreement. The most strongly supported feature was “The app’s progress-tracking dashboards increase my confidence in achieving my fitness goals,” with a mean of 3.06 (SD = 1.46), reflecting a high agreement level. All other items fell within the medium agreement range, with means ranging from 2.92 to 2.98. Notably, features related to exercise variety, motivational reminders, and workout diversity each achieved medium-level support, suggesting that while these elements are valued, they are not perceived as strongly as progress visualization. These findings underscore the pivotal role of clear, data-driven feedback in fostering both sustained exercise adherence and positive mental-health outcomes in digital fitness applications.

**Table 9. Impact of Virtual Community Interaction on Mental Health (n = 380)**

Statement	Mean	SD	Agreement Level
Interacting with other users in the app's online community reduces my feelings of loneliness.	2.92	1.45	Medium
Participation in the app's discussion forums decreases my perceived stress levels.	2.84	1.40	Medium
Engaging with peer support groups within the app improves my overall mood.	3.01	1.43	Medium
Sharing my fitness progress in the app's virtual community increases my sense of belonging.	2.92	1.40	Medium
Receiving encouragement from in-app user groups enhances my motivation to exercise.	2.98	1.38	Medium

Statement	Mean	SD	Agreement Level
Reading success stories in the app's community alleviates my anxiety.	2.93	1.38	Medium
Exchanging tips and advice with fellow users in the app improves my mental well-being.	3.02	1.36	Medium
The social features of the app (forums, user groups) foster a supportive environment that benefits my psychological resilience.	2.90	1.37	Medium

It is evident from Table 9, which examines the extent to which interaction with the virtual community within digital fitness applications enhances mental health among Jordanian high school students, that the overall mean across all eight statements was 2.94 ( $SD = 1.41$ ), indicating a medium level of agreement. The most strongly endorsed statement was “Exchanging tips and advice with fellow users in the app improves my mental well-being,” with a mean of 3.02 ( $SD = 1.36$ ), reflecting a medium agreement level. This was closely followed by “Engaging with peer support groups within the app improves my overall mood,” which recorded a mean of 3.01 ( $SD = 1.43$ ). Conversely, “Participation in the app’s discussion forums decreases my perceived stress levels” registered the lowest mean of 2.84 ( $SD = 1.40$ ). These findings suggest that while students perceive moderate benefits from virtual community engagement—particularly through exchanging practical advice and peer support—they view formal discussion forums as somewhat less impactful on stress reduction.

## 5. Conclusion & Recommendations

### 5.1. Conclusion

This study has clarified the complex relationships by using which the digital fitness apps influence how Jordan high-school students can be mentally healthy. One, the reasons to use the app were not as concentrated in the sphere of instrumental self-monitoring, e.g., tracking activities and goal setting, but rather focused on wanting a personalized plan of workouts and seeking interaction with others, which is evidence of personalized experiences and peer support desiring the students. Second, although the total mean opinions on the mental-health benefit were slightly positive, the anxiety-reduction effect came out as the best endorsed outcome, indicating the potential of app-mediated movement to act as an efficient anxiolytic addition. Third, stress-reduction and mood-intensification, as revealed on the apps, were better predictors of the volume of physical activity, whereas cognitive-based or irritability measures, not so much, supporting a dose-dependent correlation between physical exertion and affective adjustment. Fourth, real gains of physical activity, not just tracking, became visible in rising ratings of concentration and relaxation proving the paramount importance of the contrasting correlation between digital interaction and physical embodied performance. Fifth, within the app features, steps tracking dashboards generated the highest level of confidence and compliance, a factor that indicates the importance of clear and data-informed feedback circles, facilitating long-term use and psychological confirmation. Sixth, belonging and mood were modestly enriched by virtual communities in apps, with significantly less added benefit in formal discussion forums, suggesting a potentially subtle social design, in which informal sharing of advice trumps ornamented debate. Together, however, these results show that the digital fitness apps are complex socio-technical systems and, in that capacity, personalization, feedback, and community come together to mediate varied mental-health effects.

## 5.2. Recommendations

1. Software developers would do well to hone adaptive algorithms to provide contextually sensitive workout programs accessible according to the level of maturity of each student, cultural milieu and psychosocial needs.
2. Since the affirmative responses to questions on progress-tracking dashboards are extensive, the app interface should prioritize the use of easy-to-read visual analytics, including the graphs illustrating the trend of activity and stress levels, to entrench positive behaviors and promote the development of metacognitive awareness. Comparative peer benchmarks as well as interactive milestones and achievement badges can also be used in order to mobilize adherence and self-efficacy.
3. platforms are supposed to invent lighter, need-specific channels (think: Stress-Relief Hacks or Post-Exam Recovery) where people are expected to share lived experience and useful hints.
4. To further enhance the mental-health effects, the apps might presuppose the use of short text-guided meditations or breathing practices, or micro-videos about cognitive-behavioral skills, which would be automatically activated following intense exercises or during academic pressure moments.
5. School wellness programs should identify app providers to collaborate with in incorporating digital fitness tools into school wellness programs. Organized cross-class or grade-crossing fit-challenges by and with teachers and assisted by app leaderboards should make daily activity a habit and eliminate the stigma of talking about mental health.
6. Policymakers and public-health officials in Jordan ought to order chronic studies based on the aggregation, and anonymization of app data to track the tendencies of adolescent well-being. Key informations can be used to guide national mental-health campaigns, resource character, and curricular changes that insert digital health literacy content into the secondary education curriculum.
7. The future of the study ought to incorporate convergent mixed-methods designs to unravel the lived phenomenology of the application use that establishes the relationship between motivational precursors and sociocultural variables that mediate the quantitative outcomes. Through ethnographic interviews, diary studies, and focus groups, one may expect tremendous narrative accounts that may complement statistical models, leading to better epistemological understandings of digital-health ecosystems.

In sum, this research charts a roadmap for an integrative digital-health paradigm—one that marries precision personalization, robust feedback, and vibrant community engagement to cultivate mental-health resilience among adolescents. By embracing these recommendations, developers, educators, and policymakers can co-create a future in which digital fitness applications transcend mere tools and become catalysts for holistic adolescent flourishing.

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