JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

PROBLEMATIC MOBILE PHONE USE, PHYSICAL FITNESS, BODY COMPOSITION, AND EATING BEHAVIOUR AMONG FEMALE UNIVERSITY ATHLETES AND HOSTEL RESIDENTS

Ayesha Gulelala[1], Muhammad Zia Ul Haq[*2], Saba Noreen[3], Usman Ali[4]

[1, 3,4]*MPhil Scholar, Department of Sports Science and Physical Education, The Islamia University of Bahawalpur, Pakistan*
[*2]*Associate Professor, Department of Physical Education and Sports Sciences, The Islamia University of Bahawalpur, Pakistan*

[1]muhammad.zia@iub.edu.pk

DOI: https://doi.org/10.5281/zenodo.23495599

Keywords
Problematic Smartphone Use; Screen Time; Female University Students; Athletes; Hostel Residents; Physical Fitness; Eating Behaviour.

Article History
Received: *25 August 2026*
Accepted: *16 September 2026*
Published: *20 October 2026*

Copyright @Author

Corresponding Author: *
Muhammad Zia Ul Haq

Abstract

Smartphone use is an emerging issue in digital health among university students, however, the evidence regarding problematic smartphone use and objectively measured fitness, body composition and eating habits in female athletes and hostel residents is still limited. This is a cross-sectional study (n = 300) female University students, consist of Four groups each with 75 athletes and hostels residents from each institution. Mobile phone use problems, eating behaviour were assessed with adapted questionnaire items, aerobic fitness, power, flexibility, agility, sprint performance, grip strength, blood pressure, anthropometry and skinfolds were measured. Athletes performed longer standing broad jumps, more flexibility, faster 30m sprints and stronger handgrip than hostel residents, and reconstructed omnibus effects ranging from moderate to large were found for several outcomes. There were also significant differences in the selected eating-behavior items, including loss of control overeating, cue-responsive eating, binge eating without hunger and difficulty stopping before eating was finished. The differences among the skinfold measurements were small in general, while the differences among the BMI, the girth of the calf, and certain linear anthropometric measurements were between institutional and residence-sport groups. The results provide support for specific digital-wellbeing, physical-activity, nutrition, and sleep-hygiene interventions but not that the physical differences were caused by the phone use. Future studies should employ objective phone logs, accelerometry, validated complete scales, preregistered longitudinal designs, and reproducible de-identified datasets.

1. Introduction

Smart Phones have become an integral part of education, social interaction, entertainment, transportation, health monitoring and sport. Students may spend several hours on a phone and show no signs of loss of control, while another student might show signs of persistent checking, discomfort associated with withdrawal, sleep displacement and disruption of study or training despite a shorter total duration (Wacks & Weinstein, 2021). Therefore, much of the current literature has adopted the term problematic smartphone use instead of a diagnosis of clinical addiction, as the boundaries of formality are still

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

under debate and the same device can have positive or negative health impacts, depending on its use (Billieux et al., 2015; Panova & Carbonell, 2018).

Students in the university are an important group of individuals for digital-health studies. They have new independence, unpredictable schedules, educational pressures, peer comparisons, and different sleep and feeding habits. This suggests that problematic smartphone use is widespread for adolescents and young adults, but the prevalence estimates differ significantly according to the instruments, cut-off scores, country, and sampling method (Sohn et al., 2019; Meng et al., 2022). The university transition can exacerbate the habit of checking and using bedtime during the day and decrease the amount of structured movement.

There is one possible mechanism, and it is through physical activity that phone behaviour relates to health. Time is limited and extended recreational screen time can replace other activities, such as walking to and from school, cooking, or sleeping. Pirwani and Szabo (2024) conducted a systematic review of the literature on physical activity and problematic smartphone use and revealed moderate evidence that physical activity can be effective at reducing problematic smartphone use, although the literature was heterogeneous and primarily observational. Another 2025 meta-analysis also linked child, adolescent, and young adult sedentary behaviours with smartphone addiction (Nambirajan et al., 2025). But all studies do not find a direct correlation: Kumban et al. (2025) reported that there was no significant relationship between screen time and physical activity among students in a relatively small sample who were categorized as having smartphone addiction. The discrepancy implies that the length of time spent on the app is not a significant factor compared to the other factors, such as app category, time of day, individual motivation, and baseline activity.

One of the recent trends is objective measurement. Self-reported screen time is susceptible to recall error and is not always consistent with device logs. Passive sensing can detect unlocks, exposures to the application, and within-person variability across the day, and wearable monitors can measure steps, moderate-to-vigorous activity, posture, and sleep (Wacks & Weinstein, 2021). The usual and day-to-day use of the smartphone were inversely related to steps and moderate-to-vigorous activity when combined with passive smartphone sensing and thigh-mounted activity monitoring by Faust et al. (2024). In a large university-based sample, using objective measures of screen time and unlocks, Yin et al. (2025) found associations between objectively recorded screens time/unlocks and sleep quality and sleep duration, with some non-linear relationships and sex-specific results.

The first few minutes and days after the athlete uses an electronic device are especially significant in terms of their effect on cognition and recovery. Experimental research indicates that phone-related activity prior to working out can elevate mental fatigue and hinder decision making, resistance training volume or specific sport performances (Fortes et al., 2019; Fortes et al., 2021; Gantois et al., 2021). Although the evidence is still mixed, a recent systematic review, attributed to the variability in exposure tasks, sports, and outcome measures (Ong & Chua, 2025), should not discourage further research in the area. The relationship between youth and varsity athletes and their phones is also very complex, with phones facilitating communication, learning, social support and identity management, however also distracting from training, disrupting sleep, and causing team conflict (DesClouds & Durand-Bush, 2021; Ong et al., 2024). Therefore, it is not a good or a bad thing to be an athlete; sports-specific schedules may help mitigate sedentary time, and competition stress can lead to higher coping use.

Another possible route is body composition, which can be easily misinterpreted. The more likely routes are activity displacement, energy intake, sleep and food marketing. Some youth studies have reported positive relationships between screen time and BMI and adiposity, but associations differ based on device use and confounding factors (Nagata et al., 2023; Brodersen et al., 2023). Activity prompts, food logging, coaching, and mHealth programmes are also mechanisms by which smartphones could promote healthy behaviors, which have been

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

shown to have modest or context-specific benefits (Romeo et al., 2019; Seid & Fufa, 2024). It is therefore important that any analysis not assume that all phone exposure is sedentary, obesogenic, or behaviourally disordered.

Distraction, emotional coping, unscheduled eating, targeted food advertising and social comparison can affect eating behaviour. Small but significant links were identified between smartphone addiction and intuitive eating, as well as health-enhancing lifestyles, among university students by Ding et al. (2025). In a large survey of youth, Ma et al. (2025) found associations between mental-health problems and eating-disorder risk were partly mediated by smartphone addiction. In a recent systematic review that examined problematic smartphone use and/or screen time with nonclinical samples, it was concluded that an association between problematic smartphone use and/or screen time and eating-disorder psychopathology exists; the authors noted a high level of heterogeneity and a need for more robust prospective designs, however (Keeler et al., 2026).

2. Methodology

2.1 Research Design

This was a comparative cross-sectional study. The data was collected from the female students of The Islamia University of Bahawalpur (IUB) and Government Sadiq College Women University Bahawalpur (GSCWU). The cross-sectional design was suitable for making group comparisons at a single point in time. Athlete or hostel status was a non-randomized grouping variable, and mobile-phone behaviour was determined at the same time as health outcomes.

The Analytic sample was (n = 300) female students of B.S and M. Phil age 17-29 years. Four equal groups were reported – IUB athletes (n = 75), GSCWU athletes (n = 75), IUB hostel residents (n = 75), and GSCWU hostel residents (n = 75). There were 170 BS students (56.7%) and 130 MPhil students (43.3%). The participants were selected using nonprobability sampling convenience sampling. Balanced cell sizes help to enhance accuracy when comparing groups, however, convenience sampling results in a lack of representativeness. The study was adequately powered to detect omnibus group differences with n = 75 per cell, but multiplicity adjustment and outcome variance are important considerations for determining statistical power.

2.3 Measurements and Tools for Data Collection

An adapted version of Billieux et al.'s (2008) Problematic Mobile Phone Use Questionnaire (PMPUQ) was used to assess problematic mobile phone use. The initial purpose of the PMPUQ was to collect data on dangerous use, prohibited use, dependence symptoms, and financial issues. Ten four-option items were provided in the source file, but two were double-coded or inconsistently labeled, the response anchors left out a neutral option, there was no total or subscale computation rule, and there was no documentation of the direction in which to score. Therefore, the updated article only reports selected item-level means and doesn't label respondents as addicted. Permission is to be recorded, and the exact adaptation should be recorded. Eating behaviour was evaluated using 11-items that were adapted from the Three-Factor Eating Questionnaire (Karlsson et al., 2000). The original TFEQ, along with shorter versions, measures cognitive restraint, uncontrolled eating and emotional eating. Responses on the item level are provided descriptively in selected items.

2.4 Assessments for Physical Fitness

Harvard step test was used for the assessment of aerobic fitness, standing broad jump for leg power for horizontal movement, sit and reach was applied for trunk flexibility, zig -ag run test for agility, 30 m sprint for leg strength, skipping rope for coordination and leg strength, sit up for trunk strength, and handgrip for forearm force of sequenzing (Bianco et al., 2015; Ruiz et al., 2011). The Harvard step test is a classic and practical measure of cardiovascular recovery following exercise. Although other aerobic tests like the 20 m shuttle run or treadmill VO2max tests are often employed for assessing aerobic capacity, the Harvard step test remains a simple and feasible tool for aerobic fitness recovery evaluation in field settings (Henriques-Neto et al., 2020). This complements other aerobic tests frequently used in epidemiological or community settings, such as

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

the 20 m shuttle run, which is validated and reliable especially for children and adolescents

The standing broad jump is widely accepted as a measure of lower-body explosive muscular power in both youth and adults. It is included in several fitness batteries for adolescents due to its simplicity, reliability, and sensitivity to change. Sit-ups, used to assess muscular endurance of the abdominal muscles, are commonly included in test batteries as well and have demonstrated good reliability. This test provides information about muscular endurance rather than maximal strength or power. The sit and reach test is extensively employed to evaluate hamstring and lower back flexibility and has been shown to be reliable in both general and special populations (e.g., adolescents with Down syndrome) (Kirkham et al., 2015; Tejero-Gonzalez et al., 2013). Flexibility is a key component of health-related fitness and flexibility tests are widely recommended for regular assessment.

Agility tests involving course navigation, such as zig zag runs or shuttle runs (e.g., 4×10 m shuttle run), are effective in assessing speed combined with the ability to rapidly change direction. The zig zag course parallels tests like the 4×10 m shuttle run extensively validated for young athletes and adolescents, showing good reliability (Bianco et al., 2015).

Sprint tests have been shown to have moderate to excellent reliability across different test protocols, ages, and sexes, and are commonly used to assess maximal running speed (Henriques-Neto et al., 2020). A 30 m sprint is within this validated range and is very useful and predictable in terms of speed capacity. Skipping rope is a less commonly used, but still useful, test for coordination, aerobic endurance, and rhythmic motor skills and is used in some composite test battery protocols particularly with youth. Handgrip strength tests are commonly and widely used to evaluate maximal isometric strength of the upper body, and have been shown to have strong associations with musculoskeletal fitness and functional capacity across different populations including children and adolescents (Bianco et al., 2015; Ruiz et al., 2011).

This multifactorial method is consistent with the extensive physical fitness evaluation in research and practice (Bianco et al., 2015; Flórez-Gil et al., 2025). They have been shown to be feasible and consistent across repeated measures in children, adolescents and athletes (Henriques-Neto et al., 2020; Tejero-Gonzalez et al., 2013), and evidence of reliability from such studies was found. Moreover, physical fitness batteries such as these tests have been sensitive to change because of training, detraining, or health interventions (Flórez-Gil et al., 2025). If you are interested in the specifics of the tests, in normal ranges or in recommendations for specific populations, please ask.

Skipping rope is a less standardized, but less cumbersome test used to evaluate coordination, aerobic endurance and rhythmic motor skills, and is used in some composite fitness evaluation programs, particularly in youth. The bilateral handgrip strength test is a common method for measuring upper-body maximal isometric dynamism and has strong correlations with musculoskeletal fitness and functional capacity among various populations such as adolescents and adults (Bianco et al., 2015; Ruiz et al., 2011).

Studies in children, adolescents and athletes have provided evidence of their reliability for repeated measures, which validates their feasibility and consistency (Henriques-Neto et al., 2020; Tejero-Gonzalez et al., 2013). Furthermore, physical fitness batteries like these have been found to be sensitive to change because of training, detraining or health intervention (Flórez-Gil et al., 2025).

Many of the tests used in the source methods are the same and have been repeated; the method of selecting the best or average score was not always clearly indicated. The handgrip was measured using a digital dynamometer (Takei), and blood pressure was taken using a digital sphygmomanometer. A submission-ready protocol should include instrument model numbers, instrument calibration dates, sprint timing reliability, environmental conditions, familiarization of participants, assessor blinding, rest intervals, and time of day. Standardized warming up, footwear, and any restrictions on caffeine consumption or high-intensity activity prior to the test would be beneficial to improve

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

reproducibility, along with any restrictions on menstrual cycles that are relevant.

Anthropometry consisted of height, body mass, BMI, 8 skinfolds, several girths, total arm and leg lengths and some breadths. The skinfolds were taken by Harpenden caliper on the right side, and the girths and lengths were taken by anthropometric tape and breadths by calipers. Participants were evaluated in a standard position while standing or sitting, based on the site. The source did not report intra-investigator consistency, nor did it report technical error of measurement, duplicate-measure acceptance thresholds, calibration logs, or the equation used for body-fat percentage. The best practice guidelines currently recommend using an internationally standardized anthropometric protocol, repeated measurements, absolute and relative technical error, and non-prediction of fat mass or muscle mass without specifying a validated equation or imaging technique (Madden & Smith 2016).

2.5 Procedure of Data-collection

Data on demographics and questionnaires were gathered prior to or in addition to physical testing, after institutional access and participant consent. The participants were then anthropometrically and fitly assessed under the supervision of the investigator. A defensible sequence would be to first take resting values (height, mass, blood pressure, girths, breadths, and skinfolds) followed by a standardized warm up, then measure power and speed, followed by agility, muscular endurance, and then the fatiguing step test. Maximal trials should be separated by a sufficient rest period. All groups should be assessed by the same assessor, equipment, instructions, surface and order. The original thesis does not contain the ethics committee approval number, wording of informed consent, adverse event procedures, privacy safeguards, or data storage procedures; these are only recovered, not invented.

2.6 Reliability, Validity and Normality

The source mentioned item-level coefficients of c. .517-.525 for items related to mobile use, and c. .517-.529 for eating-behaviour items. These seem to be item-total or test-retest correlations, but the type of coefficient and the sample on which reliability was tested is not indicated. The anthropometric and fitness reliability table yielded reliability coefficients of .468 to about .540. The values represent moderate association at the most and should not be used as a replacement of internal consistency estimates, intra class correlation, technical error of measurement or limits of agreement. Cronbach's alpha and McDonald's omega cannot be re-calculated without participant level responses to the items. Modern Psychometric practice suggests reporting omega with alpha and assessing dimensionality prior to interpreting either coefficient (Hayes & Coutts, 2020).

Table 1. Reliability and distributional evidence available in the source file

Domain	Source evidence	Reported range	Revised interpretation
Mobile-use items	10 adapted items	.517-.525	Coefficient type unspecified; alpha/omega unavailable
Eating-behaviour items	11 adapted items	.517-.529	Coefficient type unspecified; factor scores unavailable
Fitness/anthropometric measures	Multiple field tests	.468-.540	Intra-investigator description only; ICC/TEM unavailable

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

Normality	Q-Q/P-P plots stated	No numerical output	Residual distributions cannot be independently verified

Note. ICC = intraclass correlation coefficient; TEM = technical error of measurement. The table distinguishes reported information from analyses that require raw data.

2.7 Statistical Analysis

All descriptive statistics shown as mean and standard deviation for continuous variables and frequency and percentage for the demographic categories. The four groups each had 75 participants, so one-way omnibus ANOVA statistics could be reconstructed, using the group means and the group standard deviations reported. The four means and common cell size were used to calculate the between-group sum of squares, and the four standard deviations and degrees of freedom were used to calculate the within-group sum of squares for each outcome. This gave an F statistic based on df = 3 and 296. The between-group sum of squares (SSt) and the total sum of squares (SSt) were used to calculate eta squared (η^2), which was interpreted descriptively as near .01, near .06, and near .14 for small, medium, and large, respectively (Lakens, 2013).

3. Results

3.1 Participant Profile

This study used (n = 300) female students (n = 75) in each of four institutions by status groups). BS students accounted for 56.7% (n = 170) and MPhil students for 43.3% (n = 130). The age range reported was 17-29 years and the age mean and standard deviation could not be obtained reliably due to a corruption of the demographic table. Equal group sizes mitigate concerns of imbalance, though there is no information to clarify whether athlete and hostel groups were mutually exclusive or matched by age or academic level.

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

Table 2. Physical-fitness and basic anthropometric outcomes by group

Outcome	IUB athlete	GSCWU athlete	IUB hostel	GSCWU hostel	F	p	η^2
Harvard step-test score	75.69 (4.40)	77.45 (3.80)	77.52 (3.80)	77.92 (3.40)	4.94	.002	0.048
Zigzag agility (s)	8.63 (1.06)	10.21 (10.00)	10.81 (2.30)	11.00 (1.94)	3.15	.025	0.031
Skipping rope (count/time score)	29.87 (4.30)	29.80 (3.70)	25.65 (5.60)	27.12 (6.20)	12.73	< .001	0.114
Sit-ups (count/time score)	29.69 (4.40)	28.97 (7.10)	29.35 (2.60)	27.95 (2.80)	2.02	.112	0.020
Systolic blood pressure (mmHg)	111.30 (8.10)	123.90 (20.20)	115.50 (12.00)	120.40 (23.70)	7.76	< .001	0.073
Diastolic blood pressure (mmHg)	66.08 (9.40)	65.43 (7.20)	64.75 (7.10)	64.87 (5.90)	0.49	.687	0.005
Left-hand grip (kg)	15.63 (2.90)	15.75 (4.90)	14.17 (2.20)	13.88 (2.00)	6.84	< .001	0.065
Body mass (kg)	50.22 (5.70)	54.13 (7.40)	52.38 (4.30)	53.83 (7.10)	6.12	< .001	0.058
Body mass	19.45	21.12	20.12	20.89	12.	< .0	0.1

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

index (kg/m²)	(1.60)	(2.20)	(1.50)	(2.10)	37	01	11

Note. Values are M (SD). F, p, and η^2 were reconstructed from the reported summary statistics assuming n = 75 per group and df = 3, 296.

Athletes were the most consistent fitness pattern, whereas those living in hostels were the least. The standing broad jump for IUB and GSCWU athletes was 1.59 and 1.56 m respectively, as compared to 1.40 and 1.37 m for those living in the hostels, which yielded a significant reconstructed group effect, $F(3, 296) = 41.53$, $p < .001$, $\eta^2 = .296$. There also was a significant difference in the degree of flexibility, $F(3, 296) = 24.15$, $p < .001$, $\eta^2 = .197$, with the greatest mean in the IUB athletes and least mean in the GSCWU hostel residents. Sprint times were shorter among athletes, $F(3, 296) = 19.47$, $p < .001$, $\eta^2 = .165$. Medium effects were shown by the right- and left-hand grip, and very little by Harvard step-test differences. These comparisons are of status group and institutional group differences rather than differences caused by mobile-phone behaviour.

Four group differences were very small to medium for body mass and BMI. The BMI in IUB athletes and GSCWU athletes were 19.45 kg/m² and 21.12 kg/m² respectively. Although BMI is not a direct measurement of fatness, and is not interpretable in athletes, all four-group means were within the conventional adult healthy-weight range. Although there was some intergroup variation in systolic blood pressure, this may be due to the large variation in GSCWU groups and to the lack of standardized resting conditions and should be interpreted with caution. There was no meaningful group effect using the term "diastolic pressure.

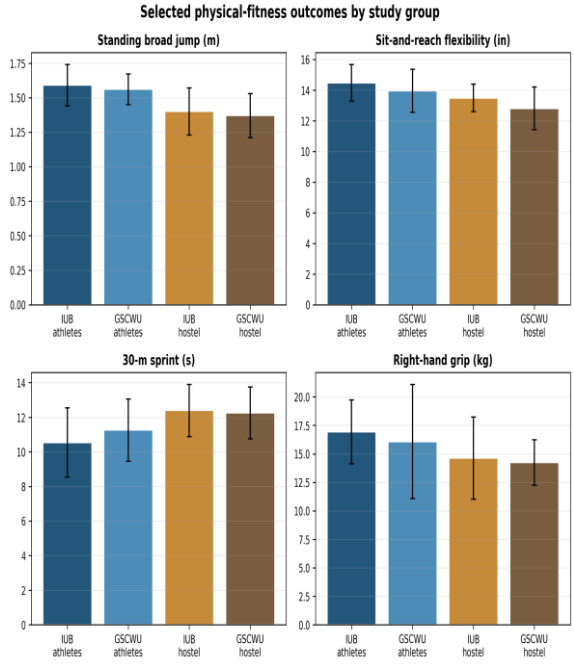


Figure 1. Selected physical-fitness outcomes across the four study groups

Note. Bars show reported means and standard deviations. Faster sprint times indicate better performance, whereas higher standing-jump, flexibility, and grip values generally indicate better performance.

Table 3. Body-composition and anthropometric outcomes

Outcome	IUB athlete	GSCWU	IUB hostel	GSCWU	F	p	η^2

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

		athlete		hostel			
Triceps skinfold (mm)	12.02 (1.83)	11.45 (0.79)	12.04 (1.46)	11.77 (1.24)	2.98	0.03	0.03
Subscapular skinfold (mm)	11.52 (0.70)	11.16 (0.94)	11.54 (0.69)	11.26 (1.02)	3.72	0.01	0.04
Biceps skinfold (mm)	10.97 (0.94)	10.65 (0.84)	11.01 (0.83)	10.91 (0.94)	2.49	0.06	0.03
Iliac-crest skinfold (mm)	11.58 (0.67)	11.28 (0.91)	11.56 (0.70)	11.30 (1.02)	2.81	0.04	0.03
Suprailiac skinfold (mm)	11.48 (0.69)	11.28 (0.95)	11.60 (0.66)	11.28 (0.98)	2.70	0.05	0.03
Abdominal skinfold (mm)	18.61 (4.27)	17.53 (2.19)	18.01 (2.93)	18.71 (2.87)	2.29	0.08	0.02
Front-thigh skinfold (mm)	26.17 (4.37)	29.47 (6.43)	27.67 (5.08)	29.88 (6.77)	6.66	<.001	0.06
Medial-calf skinfold (mm)	21.14 (4.13)	23.03 (3.80)	22.38 (2.94)	21.97 (4.52)	3.10	0.03	0.03
Waist girth	76.88 (11.	80.14 (10.	81.99 (11.	80.80 (11.	2.82	0.04	0.03

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

(cm)	44)	34)	72)	52)		
Hip girth (cm)	88.53 (7.67)	92.76 (8.63)	90.68 (5.63)	93.18 (8.55)	5.76	< .001	0.06
Calf girth (cm)	33.42 (2.32)	35.21 (3.09)	33.15 (2.95)	35.20 (2.68)	12.08	< .001	0.11
Total arm length (cm)	74.36 (3.44)	76.56 (3.33)	77.87 (2.66)	77.55 (1.71)	22.88	< .001	0.19
Total leg length (cm)	94.48 (3.01)	96.00 (3.05)	96.34 (2.02)	96.49 (2.63)	8.68	< .001	0.08
Femur breadth (cm; source label mm)	11.86 (1.09)	12.76 (2.28)	12.51 (0.51)	12.80 (0.56)	8.13	< .001	0.08

Note. Values are M (SD). Statistics were reconstructed from summary data.

Generally, differences in skinfold thickness were minor. The reconstructed η^2 values were all < .07 at individual sites and the highest of those shown is at the front thigh (η^2 = .063). The pattern does not lend itself to generalizations on whether hostel status or mobile use had a significant impact on the body fat of groups. The difference in several girths exceeded the difference between the athlete-hostel and IUB groups in the same institution – for example, calf girth was larger for the athlete-hostel groups than for the IUB groups in the same institution. There were intergroup differences in total arm length, total leg length and femur breadth, which should not be interpreted as being a result of the current use of smartphones. These are more likely to be real anthropometric differences, differences in age or maturation, differences in ancestry, differences in sport selection, or differences in measurement or transcription.

There were differences between items. Athletes reported higher irritation levels when asked to turn off the phone and higher endorsement of the items related to dangerous-context use, while hostel residents showed higher endorsement of some of the items related to ability to live without the cell phone. Positive and negative items were not completely reverse scored and there were duplicate rows so a composite dependence score was not calculated. It may not be a coherent latent construct, but instead, it may be due to wording, social desirability, or contextual differences. Thus, a valid conclusion is only possible for individual item responses.

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

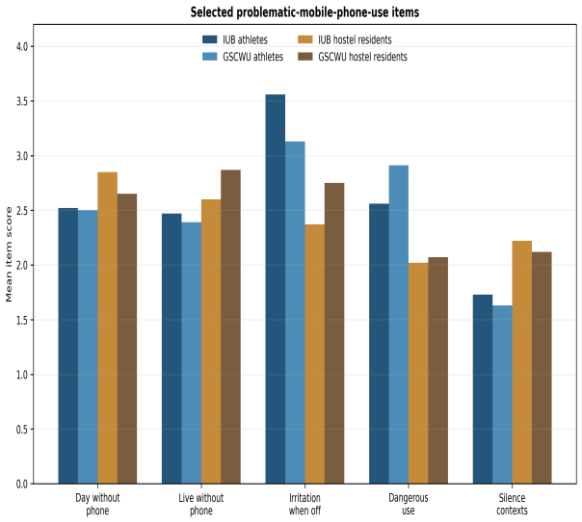


Figure 2. Selected problematic-mobile-phone-use item means

Note. The response scale was reported as four ordered categories. Mixed item direction means that a visually higher bar outcome.

Table 5. Eating-behavior items of University Students

Item (short label)	IUB athlete	GSCWU athlete	IUB hostel	GSCWU hostel	F	p	η^2
Foods perceived as fatty	2.69	2.86	2.05	2.41	7.59	< .001	0.07
Cannot stop after starting to eat	3.73	3.26	2.47	2.51	63.53	< .001	0.39
Eating triggered by food smell	3.78	3.08	2.40	2.41	37.10	< .001	0.27
Always hungry enoug	3.47	3.28	2.97	2.43	26.00	< .001	0.21

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

h to eat							
Binge eating without hunger	3.47	3.41	2.32	2.39	34.60	< .001	0.26
Difficulty stopping before plate is empty	3.39	3.56	2.17	2.12	70.18	< .001	0.42
Bottomless-pit hunger	3.43	3.45	2.35	2.26	57.00	< .001	0.37
Anxiety-related eating	2.69	3.02	3.22	3.04	6.20	< .001	0.06

Note. Item-level ANOVA was reconstructed from summary statistics.

Several eating items revealed large group differences. Athletes reported higher means on inability to stop eating once they have started eating, eating in response to food-cue induced eating, binge eating independent of hunger, difficulty stopping before finishing the food plate, and extreme hunger. The largest displayed effect was for difficulty stopping before finishing the food, $\eta^2 = .416$. Anxiety related eating showed a smaller, differently patterned association with higher means found among hostel residents. This item-specific profile contradicted the original narrative that hostel residents consistently displayed worse eating behaviour. This could reflect athletes' greater energy requirements, appetite after training, dietary restraint-disinhibition cycles or scale-scoring problems. Without validated subscale scores and dietary-intake data the results must not be equated with clinical eating disorders.

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

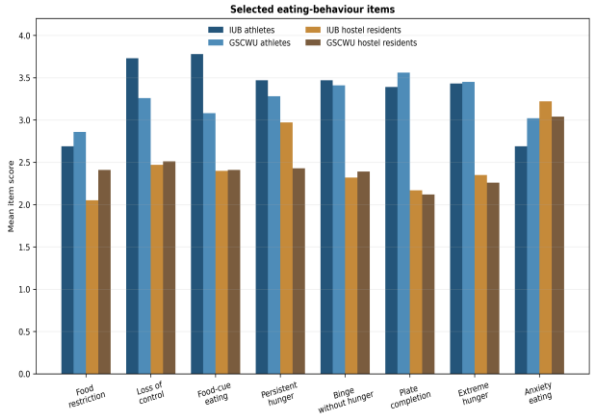


Figure 3. Selected eating-behaviour item means

Note. The graph displays item responses, not diagnostic scores. Clinical interpretation is inappropriate without validated thresholds and assessment.

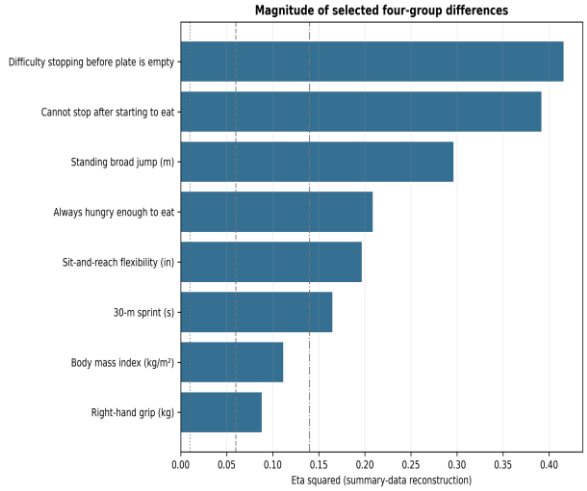


Figure 4. Effect-size profile for selected outcomes

These vertical lines exhibit descriptive benchmarks of .01, .06, and .14; with length remaining more important than thresholds alone.

4. Discussion

4.1 Principal Findings

This is a more complex argument than your initial causality statement. The female athletes had more explosive power, suppleness, sprint speed and grip force than the residents of the hostels. This is a desired outcome, since a training program focuses on and exaggerates the physical properties. The observed links between fitness and mobile phone usage would not have been revealed without a model which related a plausible score on the phone to each of the physical outcomes whilst controlling training, sport, age, sleep, diet, and other factors. This data better reflects inter-group differences in fitness, rather than the notion that using mobile telephones impacts fitness.

The body-composition results weren't definitive either. There were some differences in the BMI and in some of the girths but most of the skinfold benefits were relatively insignificant and were not consistent with hostel living. Most significantly, the use of a smartphone over the short term is not expected to affect length and breadth. It is important that these variables be discussed as dependent variables in a mobile phone study but not overstated since they may be more reflective of the population studied than the physiological effects of the treatment. Your findings show the

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

need to be wary of statistical significance versus physiological plausibility. In health research, it is inadvisable to make speculative mechanistic interpretations, and other possible conclusions should be made when the first analysis does not lead to the conclusion of the causal hypothesis.

The eating behavior items had the greatest differences between groups, although not always in the direction that you would expect. Female athletes had more uncontrolled and cue-induced eating, which might be due to their athletic status. Sports can increase energy expenditure, stimulate appetite and induce concerns of body image for women involved in sports. Concurrently, the residents of the hostels tend to be non-systematic eaters, have more access to junk food, and have more psychosocial stress, which can contribute to the dysfunctional eating habits among women. A complete factor analysis of the TFEQ could be used to determine if this observed difference between the TFEQ scores are due to disordered eating or greater nutritional awareness, and a stratification of the analysis by sport category, actual energy intake, and an examination of whether there was low energy availability and inadequate food provision.

4.3 Effectiveness of the Current Practice in Promoting Learning and Development

There is already evidence to support the benefits of regular physical activity on cardiorespiratory and muscular fitness, and the athlete-hostel fitness contrast is compatible with this. This aligns with previous studies indicating that there is an inverse relationship between physical activity and smartphone misuse, which may be explained by time replacement, self-control, mood control, and a sense of structure and routine (Yang et al., 2021; Tong et al., 2022; Pirwani & Szabo, 2024). However, Kumban et al. (2025) noted that total screen time does not always correspond to the objective screen time, a reminder that objective screen time is not the full exposure. A phone during active travel, for training feedback and for a guided workout has a different behavioural meaning from long passive scrolling.

Qualitative athlete studies also indicate benefits and harms and are consistent with the present findings at the item level for mobile use. Athletes can rely on phones to communicate with coaches, coordinate teams, review performance videos, connect with social media, and promote their personal brands; they can also feel distracted, conflicted, and feel a lack of being able to turn them off (DesClouds & Durand-Bush, 2021; Ong et al., 2024). Both reasons increased communication demands and/or differences in personality and coping are plausible explanations for the increased irritation and dangerous-use responses among athletes, but the adapted scale does not distinguish between them. Systematic evidence in recent years has highlighted the task content effects, duration of exposure, cognitive load, and timing of electronic device use in relation to training or sleep (Ong & Chua, 2025).

Experimental exposure to light can cause disruption of circadian rhythms, while sleep regularity and sleep duration are considered key factors for recovery in athletes (Chang et al., 2015; Walsh et al., 2021). In university students, Zhu's et al. (2024) study found that increased smartphone addiction was related to poorer sleep, and physical exercise partially buffered that relationship. Yin et al. (2025) furthered this research using objective device recordings to demonstrate that screen time and unlock frequency were associated with sleep outcomes in nonlinear and sex-specific manners.

The findings on eating are pertinent to the growing body of literature in digital exposure, body image and dietary regulation. Ding et al. (2025) found small correlations between the presence of smartphone addiction and intuitive eating, whereas Ma et al. (2025) found that the association between psychological difficulties and eating-disorder risk was partially mediated by the presence of smartphone addiction. The current study by Keeler et al. (2026) pooled the available research to examine the association between problematic smartphone use and screen time with eating-disorder psychopathology. It aligns with previous studies that have found an inverse relationship between physical activity and problematic smartphone use, which may be attributed to time substitution, self-regulation, mood regulation, and routine (Yang et al., 2021; Tong et al., 2022; Pirwani & Szabo, 2024). However, Kumban et al. (2025) argued that

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

objective screen duration was not always associated with physical activity, as this was not the only exposure to the screen. A phone during an active trip, during training feedback or for a guided workout has a different meaning than extended passive scrolling.

Findings from the present item-level mobile-use research also corroborate qualitative athlete research findings of benefits and harms. Athletes can rely on phones for coach-to-athlete communication, team coordination, performance video, social support, and personal branding, but can also be distracted, conflicted, and struggle to put down their phones (DesClouds & Durand-Bush, 2021; Ong et al., 2024). The different responses to irritation and dangerous use among athletes may be due to a higher communication requirement and/or personality and coping differences, which cannot be distinguished by the adapted scale. Systematic evidence in recent years highlights that electronic devices can have a negative impact on performance, depending on the task content, exposure duration, cognitive load and temporal relationship with the task content and/or sleep (Ong & Chua, 2025).

Experimental evening light exposure can delay circadian timing, and athlete-focused guidance identifies sleep regularity and duration as essential for recovery (Chang et al., 2015; Walsh et al., 2021). In university students, Zhu et al. (2024) observed that greater smartphone addiction was associated with poorer sleep and that physical exercise moderated the relationship. Yin et al. (2025) extended this work through objective device records, showing that screen time and unlock frequency related to sleep outcomes in nonlinear and sex-specific ways. The eating findings are relevant to the rapidly developing literature on digital exposure, body image, and dietary regulation. Ding et al. (2025) reported small associations between smartphone addiction and intuitive eating, while Ma et al. (2025) found smartphone addiction to be a partial mediator between psychological difficulties and eating-disorder risk. Keeler et al. (2026) synthesized emerging evidence linking problematic smartphone use and screen time with eating-disorder psychopathology. These associations may involve food advertising, appearance comparison, emotional avoidance, distracted eating, or sleep-related appetite changes. Yet reverse causation is also plausible: students with distress, loneliness, or eating concerns, may use phones more intensively for distraction or reassurance.

4.3 Latest Research Trends and Implications

The first trend is objective, context-rich metrics for exposure assessment. Device-based screen time, unlocks, notifications and category use should complement validated self-report measures. EMA allows for the measurement of affective state, craving, eating episodes and perceived fatigue near the event. The wearables measure steps, posture, heart rate and sleep. Multilevel modelling can help unravel between-person and within-person processes. This is more useful than asking whether the students who use their phones more are less active overall as it can also ask whether an individual's above-average usage of a phone is associated with decreases in movement, delayed sleep or altered appetite (Faust et al., 2024; Yin et al., 2025).

Another trend is the 24-hour movement-behaviour paradigm. There is a finite amount of time for sleep, sedentary behaviours, light activity and moderate to vigorous activity, meaning that time spent in one necessarily displaces time spent in another. Methods in the future should involve using compositional data analysis instead of analysing each behaviour as an independent one. Athletes: training load, recovery practices and travel/competition schedules. Digital exposure needs to be segmented into pre-sleep, pre-training, during training and recovery domains as the same duration can have different physiological and cognitive effects depending on the domain.

The third is for mechanism-based, individualized intervention. Rather than general bans, universities could restrict phone use at bedtime or during intrusive notifications, passive scrolling, or at mealtimes/training periods. Just-in-time adaptive interventions can be activated based on certain risk patterns, and at the same time mHealth applications can encourage people to be more physically active, eat healthier, practice mindfulness, and monitor themselves. Some reviews have shown that interventions delivered via a smartphone can have a positive impact on

JOURNAL FOR SOCIAL SCIENCE STUDIES
An International Peer-Reviewed Open Access Journal
ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

either physical activity or eating behaviour in certain groups, although the magnitudes are generally small and effects are short-lived unless sustained over time (Romeo et al., 2019; Seid & Fufa, 2024). It is important to differentiate harmful engagement and mindful, well-being-enhancing usage in digital well-being research.

5. Conclusion

The female university athletes of the two Bahawalpur institutions had slightly better performances in power, flexibility, sprint, and grip tests than hostel resident, but individual mobile phone and eating behaviors varied considerably. They differed greatly in the eating items for several uncontrolled and cue responsive eating statements, but these failed to consistently demonstrate poorer responses among women living in hostels. The differences in skinfolds were not large, and the effects of the use of smartphones are unlikely to explain any differences in the anthropometric structure. These results confirm that there was an association between context, fitness, and specific behaviors, but not a causal interpretation that smartphone use led to changes in body composition or fitness. The big lesson for college students is that isn't using a smartphone bad for fitness? If it becomes compulsive, emotional or interferes with sleep, eating habits, or concentration before exercise, however, then it should be limited. In the meantime, this technology can be applied in the process of coaching, monitoring and health education, and socialization. Colleges should encourage responsible use and provide access to athletic facilities, healthy foods and psychological services. The anonymized participant level dataset and the field notes, prior to publication, should be retrieved, cleaned up, independently audited and re-analysis with validated scores and publicly available code.

6. Recommendations

1. University intervention should be placed on digital well-being education, parental notifications, distracted eating and phone use during the class or training session and not have a screen time focus.
2. Policies for athletic departments for the use of electronic devices in team settings should be developed for each team, with consideration for the following: pre-training, during competition, recovery, travel and sleep with benefits.
3. The hostel programs should be implementing women-friendly physical activities sessions, active recreation, safe walking opportunities and breaks to reduce sedentary leisure without stigmatization of students.
4. Nutrition support includes access to affordable balanced meals, recognition of cues and athlete energy needs, and emotional eating. Students suffering from symptoms of eating disorders must be referring to qualified health care professionals, not only based on the types of questions.
5. Future studies should be using a complete validated PMPUQ or SAS-SV and validated TFEQ version, report the translation procedure and scoring instructions and provide alpha, omega, factor structure, and measurement invariance information
6. Objective phone logs, posture monitoring, and validated sleep measures should be obtained for 1-2 weeks to ensure the recordings capture within person variability to reduce the likelihood of recall bias.
7. Analyses at the participant level should be based on factorial or multilevel models to allow for partial separation of the effects of institution, athlete status, hostel residence, exposure to mobile phones, and other interactions while controlling for age, sport, training load, diet and socioeconomic factors.

REFERENCES

Bianco, A., Jemni, M., Thomas, E., Patti, A., Paoli, A., Ramos Roque, J., ... & Tabacchi, G. (2015). A systematic review to determine reliability and usefulness of the field-based test batteries for the assessment of physical fitness in adolescents–The ASSO Project. *International journal of occupational medicine and environmental health*, *28*(3), 445-478.

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

Billieux, J., Maurage, P., Lopez-Fernandez, O., Kuss, D. J., & Griffiths, M. D. (2015). Can disordered mobile phone use be considered a behavioral addiction? An update on current evidence and a comprehensive model for future research. Current Addiction Reports, 2(2), 156-162. https://doi.org/10.1007/s40429-015-0054-y

Billieux, J., Van der Linden, M., & Rochat, L. (2008). The role of impulsivity in actual and problematic use of the mobile phone. Applied Cognitive Psychology, 22(9), 1195-1210. https://doi.org/10.1002/acp.1429

Brodersen, K., Hammami, N., & Katapally, T. R. (2023). Is excessive smartphone use associated with weight status and self-rated health among youth? A smart platform study. BMC Public Health, 23, 234. https://doi.org/10.1186/s12889-023-15037-8

Chang, A.-M., Aeschbach, D., Duffy, J. F., & Czeisler, C. A. (2015). Evening use of light-emitting eReaders negatively affects sleep, circadian timing, and next-morning alertness. Proceedings of the National Academy of Sciences, 112(4), 1232-1237. https://doi.org/10.1073/pnas.1418490112

DesClouds, P., & Durand-Bush, N. (2021). Smartphones and varsity athletes: A complicated relationship. Frontiers in Sports and Active Living, 2, 560031. https://doi.org/10.3389/fspor.2020.560031

Ding, Z., Pei, Q., Fang, T., Xiao, L., Yin, D., & Sun, Z. (2025). Assessment of smartphone addiction and its relationship with health-promoting lifestyle profile and intuitive eating behavior: A cross-sectional study. Frontiers in Psychiatry, 16, 1682921. https://doi.org/10.3389/fpsyt.2025.1682921

Faust, A. M., Auerbeck, A., Lee, A. M., Kim, I., & Conroy, D. E. (2024). Passive sensing of smartphone use, physical activity and sedentary behavior among adolescents and young adults during the COVID-19 pandemic. Journal of Behavioral Medicine, 47(5), 770-781. https://doi.org/10.1007/s10865-024-00499-x

Flórez-Gil, E., Vaquera, A., Rodríguez-Fernández, A., & Rodríguez-Marroyo, J. A. (2025). Anthropometric profile of female basketball players: The influence of competitive level and playing position. *Journal of Human Sport and Exercise*, *20*(3), 821-828.

Fortes, L. S., Lima-Junior, D. D., Gantois, P., Nascimento-Junior, J. R. A., & Fonseca, F. S. (2021). Smartphone use among high-level swimmers is associated with mental fatigue and slower 100- and 200-m freestyle racing. Perceptual and Motor Skills, 128(1), 390-408. https://doi.org/10.1177/0031512520958935

Fortes, L. S., Lima-Junior, D., Nascimento-Junior, J. R. A., Costa, E. C., Matta, M. O., & Ferreira, M. E. C. (2019). Effect of exposure time to smartphone apps on passing decision-making in male soccer athletes. Psychology of Sport and Exercise, 44, 35-41. https://doi.org/10.1016/j.psychsport.2019.05.015

Gantois, P., Lima-Junior, D. D., Fortes, L. S., Batista, G. R., Nakamura, F. Y., & Fonseca, F. S. (2021). Mental fatigue from smartphone use reduces volume-load in resistance training: A randomized, single-blinded crossover study. Perceptual and Motor Skills, 128(4), 1640-1659. https://doi.org/10.1177/0031512521101 6233

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

Hayes, A. F., & Coutts, J. J. (2020). Use omega rather than Cronbach's alpha for estimating reliability. But... Communication Methods and Measures, 14(1), 1-24. https://doi.org/10.1080/19312458.2020.1718629

Henriques-Neto, D., Minderico, C., Peralta, M., Marques, A., & Sardinha, L. B. (2020). Test–retest reliability of physical fitness tests among young athletes: The FITescola® battery. *Clinical physiology and functional imaging*, *40*(3), 173-182.

Karlsson, J., Persson, L.-O., Sjostrom, L., & Sullivan, M. (2000). Psychometric properties and factor structure of the Three-Factor Eating Questionnaire (TFEQ) in obese men and women: Results from the Swedish Obese Subjects study. International Journal of Obesity, 24(12), 1715-1725. https://doi.org/10.1038/sj.ijo.0801442

Keeler, J., Conde Ludtke, L., Yang, Q., Raschke Rameh, V., Ward, R., Treasure, J., & Carter, B. (2026). Associations of problematic smartphone use and smartphone screen time with eating disorder psychopathology in non-clinical samples: A systematic review. JMIR Mental Health, 13, e88572. https://doi.org/10.2196/88572

Kirkham, A. A., Neil-Sztramko, S. E., Morgan, J., Hodson, S., Weller, S., McRae, T., & Campbell, K. L. (2015). Health-related physical fitness assessment in a community-based cancer rehabilitation setting. *Supportive Care in Cancer*, *23*(9), 2525-2533.

Kumban, W., Cetthakrikul, S., & Santiworakul, A. (2025). Smartphone addiction, screen time, and physical activity of different academic majors and study levels in university students. International Journal of Environmental Research and Public Health, 22(2), 237. https://doi.org/10.3390/ijerph22020237

Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: A practical primer for t-tests and ANOVAs. Frontiers in Psychology, 4, 863. https://doi.org/10.3389/fpsyg.2013.00863

Lepp, A., Barkley, J. E., Sanders, G. J., Rebold, M., & Gates, P. (2013). The relationship between cell phone use, physical and sedentary activity, and cardiorespiratory fitness in a sample of U.S. college students. International Journal of Behavioral Nutrition and Physical Activity, 10, 79. https://doi.org/10.1186/1479-5868-10-79

Ma, R., Min, K., Meng, Z., Yang, J., Zhang, H., & Li, Q. (2025). The mediating effects of smartphone addiction in the association between mental disorders and eating disorders: Findings from a nationwide survey among Chinese youth. BMC Public Health, 25, 2401. https://doi.org/10.1186/s12889-025-23608-0

Madden, A. M., & Smith, S. (2016). Body composition and morphological assessment of nutritional status in adults: A review of anthropometric variables. Journal of Human Nutrition and Dietetics, 29(1), 7-25. https://doi.org/10.1111/jhn.12278

Meng, S.-Q., Cheng, J.-L., Li, Y.-Y., Yang, X.-Q., Zheng, J.-W., Chang, X.-W., Shi, Y., Chen, Y., Lu, L., Sun, Y., Bao, Y.-P., & Shi, J. (2022). Global prevalence of digital addiction in general population: A systematic review and meta-analysis. Clinical Psychology Review, 92, 102128. https://doi.org/10.1016/j.cpr.2022.102128

Nagata, J. M., Smith, N., Alsamman, S., Lee, C. M., Dooley, E. E., Kiss, O., Ganson, K. T., Wing, D., Baker, F. C., & Gabriel, K. P. (2023). Association of physical activity and screen time with body mass index among U.S. adolescents. JAMA Network Open, 6(2), e2255466. https://doi.org/10.1001/jamanetworkopen.2022.55466

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

Nambirajan, M. K., Vidusha, K., Kailasam, J. G., Kannan, S., Govindan, D., Ganesh, K., Priyan, S., & Krishnamoorthy, Y. (2025). Association between smartphone addiction and sedentary behaviour amongst children, adolescents and young adults: A systematic review and meta-analysis. Journal of Psychiatric Research, 184, 128-139. https://doi.org/10.1016/j.jpsychires.2025.02.049

Ong, N. C. H., & Chua, J. H. E. (2025). The effects of electronic device use on athlete performance and health: A systematic review. International Journal of Sport and Exercise Psychology, 23(7), 1086-1114. https://doi.org/10.1080/1612197X.2024.2386318

Ong, N. C., Kee, Y. H., Pillai, J. S., Lim, H. B., & Lin, Y. C. (2024). Problematic mobile phone use among youth athletes: A qualitative investigation using focus groups. International Journal of Sport and Exercise Psychology, 22(3), 645-666. https://doi.org/10.1080/1612197X.2022.2152855

Panova, T., & Carbonell, X. (2018). Is smartphone addiction really an addiction? Journal of Behavioral Addictions, 7(2), 252-259. https://doi.org/10.1556/2006.7.2018.49

Pirwani, N., & Szabo, A. (2024). Could physical activity alleviate smartphone addiction in university students? A systematic literature review. Preventive Medicine Reports, 42, 102744. https://doi.org/10.1016/j.pmedr.2024.102744

Rebold, M. J., Lepp, A., Sanders, G. J., & Barkley, J. E. (2015). The impact of cell phone use on the intensity and liking of a bout of treadmill exercise. PLOS ONE, 10(5), e0125029. https://doi.org/10.1371/journal.pone.0125029

Romeo, A., Edney, S., Plotnikoff, R., Curtis, R., Ryan, J., Sanders, I., Crozier, A., & Maher, C. (2019). Can smartphone apps increase physical activity? Systematic review and meta-analysis. Journal of Medical Internet Research, 21(3), e12053. https://doi.org/10.2196/12053

Ruiz, J. R., Castro-Piñero, J., España-Romero, V., Artero, E. G., Ortega, F. B., Cuenca, M. M., ... & Castillo, M. J. (2011). Field-based fitness assessment in young people: the ALPHA health-related fitness test battery for children and adolescents. *British journal of sports medicine*, *45*(6), 518-524.

Seid, A., & Fufa, D. D. (2024). The use of internet-based smartphone apps consistently improved consumers' healthy eating behaviors: A systematic review of randomized controlled trials. Frontiers in Digital Health, 6, 1282570. https://doi.org/10.3389/fdgth.2024.1282570

Sohn, S. Y., Rees, P., Wildridge, B., Kalk, N. J., & Carter, B. (2019). Prevalence of problematic smartphone usage and associated mental health outcomes amongst children and young people: A systematic review, meta-analysis and GRADE of the evidence. BMC Psychiatry, 19, 356. https://doi.org/10.1186/s12888-019-2350-x

Tong, W.-X., Li, B., Han, S.-S., Han, Y.-H., Meng, S.-Q., Guo, Q., Ke, Y.-Z., Zhang, J.-Y., Cui, Z.-L., Ye, Y.-P., Zhang, Y., Li, H.-L., Sun, H., & Xu, Z.-Z. (2022). Current status and correlation of physical activity and tendency to problematic mobile phone use in college students. International Journal of Environmental Research and Public Health, 19(23), 15849. https://doi.org/10.3390/ijerph192315849

Wacks, Y., & Weinstein, A. M. (2021). Excessive smartphone use is associated with health problems in adolescents and young adults. Frontiers in Psychiatry, 12, 669042. https://doi.org/10.3389/fpsyt.2021.669042

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 6 • October 2026

Walsh, N. P., Halson, S. L., Sargent, C., Roach, G. D., Nedelec, M., Gupta, L., Leeder, J., Fullagar, H. H. K., Coutts, A. J., Edwards, B. J., Pullinger, S. A., Robertson, C. M., Burniston, J. G., Lastella, M., Le Meur, Y., Hausswirth, C., Bender, A. M., Grandner, M. A., & Samuels, C. H. (2021). Sleep and the athlete: Narrative review and 2021 expert consensus recommendations. British Journal of Sports Medicine, 55(7), 356-368. https://doi.org/10.1136/bjsports-2020-102025

Yang, G., Li, Y., Liu, S., Liu, C., Jia, C., & Wang, S. (2021). Physical activity influences the mobile phone addiction among Chinese undergraduates: The moderating effect of exercise type. Journal of Behavioral Addictions, 10(3), 799-810. https://doi.org/10.1556/2006.2021.00059

Yin, J., Tang, X., Liu, Z., Gong, Y., Yang, H., & Zhang, Y. (2025). Associations between both smartphone addiction and objectively measured smartphone use and sleep quality and duration among university students: Cross-sectional study. JMIR Mental Health, 12, e77796. https://doi.org/10.2196/77796

Zhu, W., Liu, J., Lou, H., Mu, F., & Li, B. (2024). Influence of smartphone addiction on sleep quality of college students: The regulatory effect of physical exercise behavior. PLOS ONE, 19(7), e0307162. https://doi.org/10.1371/journal.pone.0307162

JOURNAL FOR SOCIAL SCIENCE STUDIES
ADVANCING KNOWLEDGE, INSPIRING SOCIETY