

Post-concussion screen time duration and type and its association with symptom resolution in youth aged 11–17 years

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► Additional supplemental material is published online only. To view, please visit the journal online (<https://doi.org/10.1136/bjsports-2025-110310>).

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Poster presentation at the Society for the Advancement of Violence and Injury Research 2024 Annual Meeting, Chapel Hill, North Carolina, USA, 15–17 April 2024. Oral presentation at the Concussion in Sport Group Symposium, Milwaukee, Wisconsin, USA, 30 April to 1 May 2025.

Accepted 21 April 2026

ABSTRACT

Objective To examine associations in youth between objectively measured screen time (duration and type) during the first week post concussion and time to symptom resolution.

Study design We retrospectively analysed a school-going cohort aged 11–17 enrolled within 72 hours of sustaining a concussion. Participants wore a Narrative Clip (mini-camera) for 7 days to objectively capture out-of-school screen time, measured in minutes per standardised 960-minute day. Screen time use was classified as smartphone, television (TV), computer/tablet or gaming. The outcome was days to symptom resolution.

Results Among 80 participants (mean age 14.3 years, 65.0% male), average daily post-concussion screen time was 358.4 min (SD=329.9). Smartphone use was most common (224.4 min/day), followed by watching TV (203.5 min/day), computer/tablet use (112.8 min/day) and gaming (59.7 min/day). In adjusted Cox proportional hazards models, an optimal median of 141 min/day during the first 3 days post concussion was associated with a 1.35-fold higher rate of symptom resolution compared with 260 min/day (95% CI 1.03 to 1.77). Exploratory analyses showed that moderate screen time (120–240 min/day) was associated with faster symptom resolution compared with more restricted use of <120 min/day (HR=2.27, 95% CI 1.20 to 4.29) or prolonged use of >240 min/day (HR=1.58, 95% CI 0.86 to 2.93). Similar trends were observed for smartphone and TV use.

Conclusions In this cohort of youth, moderate screen time, about 141 min/day during the first 3 days following concussion, was associated with faster symptom resolution. Rather than complete avoidance, clinicians may consider recommending this balanced level of use to support concussion recovery.

INTRODUCTION

Recent research indicates that screen time may affect concussion recovery in youth. Concerns have been raised that screen light intensity or prolonged exposure could lead to eye strain, visual discomfort, cognitive overload and disrupted sleep cycles, potentially worsening post-concussion symptoms (PCS).^{1–3} While studies have cited these concerns, limited research has directly explored relationships between screen time and paediatric concussion recovery. A randomised clinical trial involving concussion patients aged 12–25 found that those instructed to avoid screen time for the first 48

WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Prolonged or intense screen exposure may cause eye strain, cognitive overload and sleep disruption, potentially worsening post-concussion symptoms.
- ⇒ Limited research suggests avoiding screen time for the first 48 hours post concussion may accelerate symptom resolution by about 4.5 days. The relationship between early screen use (within 7–10 days) and symptoms appears non-linear, with moderate use linked to better outcomes than minimal or high use.

WHAT THIS STUDY ADDS

- ⇒ An optimal median screen time of 141 min/day during the first 3 days post concussion was associated with a 1.35-fold higher rate of symptom resolution compared with 260 min/day.
- ⇒ In the first 3 days post concussion, youth with 120–240 min of daily screen time had a 2.27-fold faster symptom resolution compared with those with <120 min/day and a 1.58-fold faster symptom resolution compared with those with >240 min/day.
- ⇒ Using smartphones for 120–240 min/day was associated with 2.47 times faster symptom resolution compared with use of <120 min/day and 2.42 times faster than use >240 min/day. Similarly, watching television for 60–120 min/day was associated with 1.77 times faster symptom resolution than watching for <60 min/day and 3.10 times faster than watching for >120 min/day.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ Further clinical trials are needed to determine the optimal total screen time and specific types of screen activities that may facilitate recovery from concussions in youth. Findings may help clinicians guide youth towards moderate screen use to support concussion recovery.

hours following a concussion recovered approximately 4.5 days sooner than those allowed screen time.⁴ An observational study revealed that the relationship between early screen time (during the first 7–10 days post injury) and PCS is not linear; children in the 25th–50th percentiles experienced less severe symptoms than those with minimal or



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To cite: Desai N, Alshaikh E, Yeates KO, et al. *Br J Sports Med* Epub ahead of print: [please include Day Month Year]. doi:10.1136/bjsports-2025-110310

higher screen use.⁵ Both studies underscore the need for further research to understand the role of screen time in concussion recovery, including defining specific timing, dosing and mechanism for reengaging in screen use to facilitate recovery.^{4–6}

Currently, most concussion management protocols do not provide specific recommendations for the ideal timing or duration of screen time use post injury. As a result, patients often find themselves self-regulating.^{7–9} Furthermore, research related to screen time has notable limitations; it relies on self-reported screen time and overlooks the specific types of screen activities. Whether it is watching television (TV), using a smartphone or playing video games, these activities all fall under screen time but may lead to varying levels of eye strain, photic stimulation and cognitive demand, potentially affecting concussion recovery differently.^{10–12}

To address gaps in the current literature, this study aimed to describe objectively measured screen time use outside school, including screen time duration (minutes per standardised day) and type of screen time (smartphone, TV, computer/tablet and gaming), during the first week post concussion among youth aged 11–17 years. Additionally, we examined the association between the amount of screen time during the first 3 days post concussion and the time to symptom resolution. We hypothesised that both too little and too much screen time during the first 3 days post concussion would be associated with an increased risk of prolonged symptom resolution.

METHODS

Study design

We retrospectively analysed data from a prospective cohort study with repeated measures. Youth aged 11–17 with a physician-confirmed concussion were enrolled within 72 hours of injury after providing written assent and consent. Concussion was defined as a mild traumatic brain injury induced by a direct or indirect blow to the head, neck, face or other part of the body, resulting in transient neurological deficits.¹³ Participants were followed until symptom resolution (symptom-free or symptoms returned to preinjury level) or up to 45 days post injury, whichever came first. Symptom resolution was determined based on youth-rated symptoms from the daily Post-Concussion Symptom Scale¹⁴ surveys and was confirmed by a certified athletic trainer or physician via email or written documentation. Daily surveys continued until symptom resolution was confirmed. Study protocols have been detailed elsewhere.^{15 16}

Cognitive activity over the first 7 days post injury was monitored using the Narrative Clip (NCLP1-08TW01WHT), a wearable camera that automatically captured high-resolution images every 30 s.¹⁷ To protect privacy, participants wore the device on their forehead only outside school. Images, stamped with date and time, were processed into time-lapse sequences using custom software and coded by two trained raters with established interrater reliability.^{15 16} Cognitive activities captured by the Narrative Clip included listening to music, watching TV, texting, using a computer, gaming, socialising, studying and driving.^{15 18} For this study, we focused on four types of screen-related activities: smartphone use, watching TV, computer/tablet use and gaming (including video, computer and handheld gaming). This report follows Strengthening the Reporting of Observational Studies in Epidemiology reporting guidelines for observational studies.¹⁹

Study participants

Study participants, recruited from local schools pre injury or in the emergency department and concussion clinics post injury,

were enrolled within 72 hours of injury. Youth were eligible if they were aged 11–17 years, received a physician-confirmed concussion diagnosis and were able to complete the first assessment within 72 hours of injury. Youth were excluded if their concussion (1) was accompanied by other trauma (eg, face or neck injury, broken bone), (2) involved a penetrating injury, (3) required neurosurgical intervention or hospital admission or (4) the youth had a condition(s) that prevented them from being able to wear the study devices.¹⁵

Study variables

PCS were assessed daily by having youth complete the Post-Concussion Symptom Scale based on their symptoms at the time of survey completion.¹⁴ The participants were also asked to retrospectively rate their symptoms at injury during their initial clinical visit. The scale, which is a commonly used concussion assessment tool among clinicians, consists of 22 symptoms, each rated from 0 (no symptoms) to 6 (severe symptoms) (score range=0–132), with established reliability and normative data.¹⁴ Of the 22 symptoms, 2 were related to visual function (ie, light sensitivity, visual problem). Thus, we created a dichotomous variable indicating whether a youth had any visual-related symptom with a score greater than zero at day 1 post injury. We categorised the total PCS score at injury into three levels (low, moderate and high acute symptom severity) based on the PCS distribution.

Screen time type was measured based on the type of device used for screen activity outside school using data recorded by the Narrative Clip. Four categories of screen time type were created: (1) smartphone, (2) TV, (3) computer/tablet and (4) gaming (computer gaming, videogaming or handheld gaming).

Screen time duration was defined as the number of minutes spent on activities involving screen use outside school, based on the number of frames recorded. Screen time duration was measured in 30-second increments due to the capture rate of the Narrative Clip. When participants engaged in screen time with multiple devices simultaneously (eg, watching TV and texting), we counted the overall screen time duration as one period for overlapping screen activities but recorded the same screen time duration for each type of overlapped screen activity. Due to variations in the Narrative Clip wear times among participants (mean=591 min/day, ranging from 0 to 1440), we standardised the screen time to 16 hours/day (ie, 960 min/day) in our analysis.

Other variables included participant sex, age, race, history of concussion, whether injured in sport activity, and dates of symptom resolution and return to school.

Statistical analysis

We imputed missing daily screen time (min/day) for each screen type from days 1–7 post concussion using multiple imputation with fully conditional specification (five imputations),²⁰ restricting imputation to days prior to symptom resolution. Missing data accounted for less than 5% of total observations on each day, except for day 1 (10.6%) and day 7 (5.8%). Imputation quality was evaluated by comparing means and SD between the observed and imputed data. We then summarised and graphed median daily screen time over the first week post injury, stratified by the tertiles of acute symptom severity. Differences in total screen time and screen type across participant and injury characteristics were analysed using Generalized Estimating Equations. Statistical significance was evaluated using the Benjamini-Hochberg false discovery rate adjustment to correct for multiple comparisons within rows.

We used Cox proportional hazards models to evaluate the association between screen time during the first 3 days post concussion and time to symptom resolution, estimating HRs and 95% CIs. Symptom resolution was the event of interest, with survival time defined as days from injury to either symptom resolution or 45 days post injury (censored). An HR > 1 indicated a greater likelihood of symptom resolution. Model assumptions, including linearity and proportional hazard, were assessed using cumulative martingale residual plots and the Kolmogorov-type supremum test (500 simulations). When assumptions were violated, restricted cubic splines were applied. Specifically, in the primary adjusted Cox model, median screen time during the first 3 days post concussion was modelled as a continuous variable using restricted cubic splines with five knots placed at the 5th, 27.5th, 50th, 72.5th and 95th percentiles. Covariates included sex, age, visual-related symptoms at injury and average PCS score during the first 3 days post injury.

For interpretability and clinical relevance, we produced secondary unadjusted exploratory Cox models, categorising median screen time in the first 3 days as <120, 120–240 or >240 min/day (online supplemental file 1a). Cut points were derived from a generalised additive model and refined through visual inspection to reflect observed patterns while ensuring meaningful clinical relevance (online supplemental file 1b).²¹ We repeated these analyses for each screen type, using type-specific cut points to examine associations between screen use during the first 3 days post concussion and time to symptom resolution. We focused on the first 3 days because (1) this period is most critical for clinical guidance and (2) screen time data were collected only outside of school hours, with over half of participants (54%) returning to school part-time or full time by day 4 post injury. All analyses were conducted between January and December 2024 using SAS, V.9.4.

Equity, diversity and inclusion

Sex and race/ethnicity exclusions were not used in this study. All eligible patients were approached. Three of the seven listed authors are women. We included authors from a variety of career stages and clinical disciplines.

RESULTS

Participant and screen time characteristics

Among the 80 participants, 65.0% were male, 71.3% were white and the mean age was 14.3 years (SD=1.9). Most concussions (83.3%) were sport-related. Concussions occurred throughout the week, with 73% occurring on weekdays, including 10% on Fridays. The median follow-up time was 16 days post injury (IQR, 9 days); 6 (8%) participants still had symptoms at 45 days post injury. Average screen time outside school during the first week post injury was 358.4 min/day (SD=329.9) (table 1). Smartphone use was most common (224.4 min/day), followed by watching TV (203.5 min/day), computer/tablet use (112.8 min/day) and gaming (59.7 min/day).

As shown in table 1, females spent more time on smartphones (280.4 vs 195.3 min/day) and computers (159.0 vs 87.1 min/day), while males watched more TV (225.8 vs 160.2 min/day). Symptom severity at injury and demographic factors were not associated with screen time or type. Youth with vision-related PCS symptoms watched less TV (185.1 vs 256.5 min/day).

Median daily screen time during the first week post concussion by acute symptom severity

Median screen time varied by acute symptom severity (figure 1). On day 1 post concussion, median screen time was 276 min/day (IQR=380) for participants with low acute PCS scores, 369 min/day (IQR=662) for those with moderate PCS scores and

Table 1 Total screen time and specific screen activity during the first week post concussion by participant and injury characteristics

		Total screen time	Smartphone use	Watching TV	Computer/tablet use	Gaming
		Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
	Overall	358.4 (329.9)	224.4 (289.7)	203.5 (292.7)	112.8 (211.2)	59.7 (136.5)
Sex	Male	350.8 (328.2)	195.3 (280.4)	225.8 (299.6)	87.1 (227.5)	69.3 (148.7)
	Female	373.3 (333.3)	280.4 (299.8)	160.2 (275.0)	159.0 (299.9)	41.1 (105.9)
Age	11-14 years	359.5 (326.3)	228.2 (299.2)	206.2 (285.2)	109.3 (206.8)	68.8 (197.9)
	15-17 years	357.2 (334.0)	220.6 (280.4)	200.7 (300.5)	116.2 (216)	30.2 (131.0)
Race	White	345.5 (328.0)	203.1 (278.7)	203.4 (291.6)	102.8 (201.6)	48.2 (112.6)
	Non-white	390.2 (333.0)	276.9 (307.6)	203.6 (295.8)	137.5 (231.7)	88.3 (179.3)
Injured in sport	Yes	366.8 (328.7)	239 (297.3)	203.5 (292.3)	116.6 (212.4)	65.6 (144.1)*
	No	316.8 (330.8)	150.8 (231.8)	203.1 (296.3)	93.9 (205.7)	30.4 (83.5)
Concussion history	Yes	348.2 (331.0)	215.7 (288.3)	211.6 (314.5)	87.6 (187.0)	36.9 (95.2)
	No	362.3 (329.9)	227.8 (294.3)	200.3 (284.0)	122.4 (219.8)	68.5 (148.9)
Acute symptom severity by PCS Score (at injury)	Low: <37	393.6 (336.3)	257.1 (304.9)	219.8 (294.9)	114.9 (219.6)	61.5 (149.2)
	Moderate: ≤37 and <52	314.7 (332.1)	179.4 (266.7)	151.1 (263.2)	94.7 (201.8)	49.6 (112.6)
	High: ≥52	371.1 (318.0)	240.7 (293.9)	245.5 (314.0)	130.7 (212.7)	69.2 (147.4)
Vision-related PCS (day 1 post injury)	Yes	311.3 (329.9)	233.4 (294.4)	185.1 (292.1)	109.4 (211)	58.2 (143.2)
	No	358.7 (332.5)	217.8 (278)	256.5 (300)	123.5 (208.1)	62.8 (127.0)
Day of the week†	Weekday	343.9 (331.0)	206 (283.2)	191.5 (287.3)	111.2 (213.6)	57.9 (129.8)
	Weekend	392.4 (327.0)	273.3 (301.5)	235 (304.0)	116.9 (205.6)	64.7 (152.8)
Going to school‡	No	360.7 (324.0)	234.9 (282.9)	222.3 (194.3)	95.9 (198.6)	70.9 (156.9)*
	Yes	352.1 (338.0)	211.7 (278.5)	177.3 (165.6)	127 (222.0)	44.2 (113.1)

*P value was <0.05, indicating statistically based on the Benjamini-Hochberg false discovery rate adjustment to correct for multiple comparisons within rows.

†Day of the week and going to school were time-varying variables.
PCS, post-concussion symptoms.

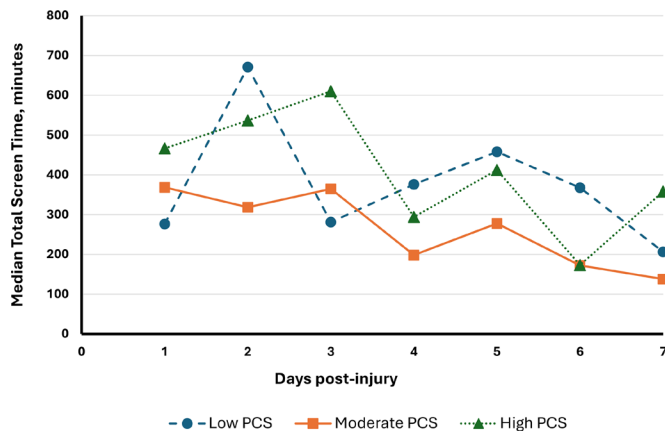


Figure 1 Median daily screen time during the first week post concussion by acute symptom severity. PCS, post-concussion symptoms.

467 min/day (IQR=351) for those with high PCS scores. By day 2, median screen time increased to 671 min/day in the low PCS group and 537 min/day in the high PCS group but decreased to 319 min/day in the moderate PCS group. On day 3, screen time dropped sharply in the low PCS group (281 min/day) but rose to 365 min/day and 610 min/day in the moderate and high PCS groups, respectively. Median screen time then declined gradually across all groups. In parallel, average PCS scores declined from 33.1 on day 1 post injury to 14.1 by day 7 post injury (data not shown).

Screen time during the first 3 days post concussion and symptom resolution

Accounting for the non-linear relationship between screen time (treated as a continuous variable) and symptom resolution, and adjusting for relevant covariates, an optimal median screen time of 141 min/day during the first 3 days post concussion was associated with a 1.35-fold higher rate of symptom resolution (adjusted HR=1.35, 95% CI 1.03 to 1.77) compared with a median of 260 min/day (figure 2a). In exploratory analyses, youth with a median screen time of 120–240 min/day during the first 3 days post concussion had faster symptom resolution than those with less than 120 or more than 240 min/day (figure 2b and table 2, log-rank $p=0.03$). Specifically, youth with median screen time of 120–240 min/day had a 2.27-fold higher rate of symptom resolution than those with <120 min/day (HR=2.27, 95% CI 1.20 to 4.29) and a 1.58-fold higher rate of symptom resolution than those with >240 min/day (HR=1.58, 95% CI 0.86 to 2.93, table 2), although the latter was not statistically significant.

Screen time type during the first 3 days post concussion and symptom resolution

Youth with median smartphone use of 120–240 min/day had a 2.47-fold faster symptom resolution compared with those using smartphones less than 120 min/day (HR=2.47, 95% CI 1.25 to 4.86) and a 2.42-fold faster symptom resolution compared with those using smartphones more than 240 min/day (HR=2.42, 95% CI 1.15 to 5.12; log-rank $p=0.02$, table 2). Similarly, TV viewing for 60–120 min/day was associated with a 1.77-fold faster symptom resolution compared with those viewing less than 60 min/day (HR=1.77, 95% CI 0.73 to 4.25) although statistically insignificant and a 3.10-fold faster symptom resolution compared with those viewing more than 120 min/day (HR=3.10, 95% CI 1.29 to 7.48; log-rank $p=0.01$, table 2). No

significant associations were observed for computer/tablet use or gaming.

DISCUSSION

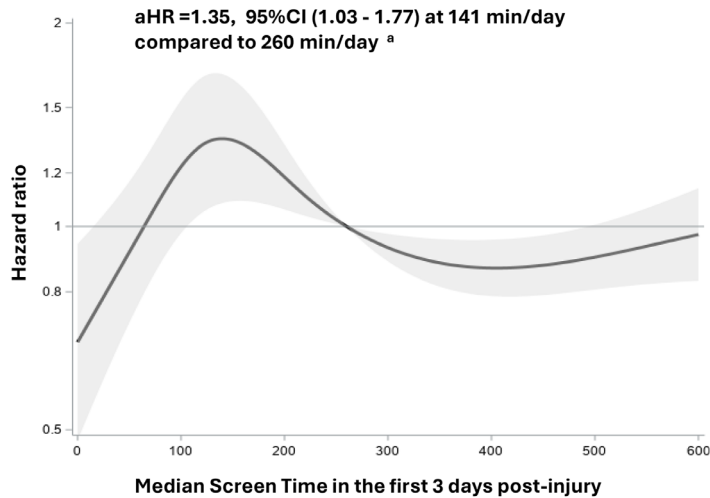
This study found that in this group of 80 youth, those who engaged in moderate daily screen time of 120–240 min during the first 3 days post concussion experienced faster symptom resolution than those with more restricted or prolonged screen use. A median of 141 min/day was associated with a 35% faster recovery compared with 260 min/day. Similar trends were observed for smartphone and TV use, with moderate levels consistently associated with quicker recovery. In contrast, computer/tablet use or gaming were not significantly related to symptom resolution. These findings suggest that moderate screen time—not too little or too much—may support concussion recovery, reinforcing previous research on the value of balanced screen time.^{4–6} Further studies with larger, more diverse samples are needed to confirm these results.

In our study, youth with high PCS scores had the most screen time on day 1 post injury. Possibly these youth had reduced physical activity due to symptom burden or physician recommendations, which might in turn lead to greater engagement in sedentary activities such as screen use. This interpretation aligns with our prior work showing that higher symptom scores during days 1–3 post injury were associated with lower physical activity the following day¹⁸; however, our observational design precludes causal inference.

Blue light from screens (eg, computers, TVs and smartphones) may affect brain function in two key ways.^{1–3} First, blue light increases attention and arousal,^{1,3} which may interfere with the rest needed during acute concussion recovery.²² Second, blue light disrupts sleep cycles and circadian rhythms,^{1–3,23} both critical for brain healing.^{24–28} Our results indicate that daily screen use exceeding 240 min, particularly on a smartphone, was associated with slower symptom resolution compared with moderate use (120–240 min/day). Excessive screen time can contribute to visual strain and cognitive overload, worsening symptoms such as headaches and dizziness.^{5,27,29,30} Because screen engagement requires continuous attention and rapid information processing, it may further tax the recovering brain.^{1,11} Additionally, screen use before bed can suppress melatonin production,^{3,30} disrupting sleep, an essential factor in concussion recovery.^{28,31} Therefore, maintaining moderate screen use, ideally around 141 min/day during the first 3 days after a concussion, may help shorten symptom duration and promote faster recovery.^{4,6}

Too little screen time may contribute to social isolation, as many youth now rely on digital platforms for social interaction.^{9,32} Our findings suggest that youth with less than 120 min of daily screen use experienced slower symptom resolution compared with those with 120–240 min/day. This supports prior research showing that moderate screen time was associated with less severe concussion symptoms than minimal or excessive use.⁵ Similarly, a large study of over 120 000 English adolescents found that both high (eg, 2+ hours) and very low or no smartphone use were linked to lower well-being,³³ supporting the ‘digital Goldilocks hypothesis’—the idea that moderate screen use promotes goal-setting, engagement and social connection.³³ Notably, Macnow’s clinical trial reported average screen time of ~65 min/day in their intervention group and ~315 min/day in their control group—both outside our identified 120–240 min optimal range.^{4,6} These discrepancies may reflect differences in how screen time was measured; our study only captured screen use outside school. In today’s digital age, social connection

a Nonlinear association between median screen time and symptom resolution



b Median daily screen time during the first 3 days post-concussion and symptom resolution.

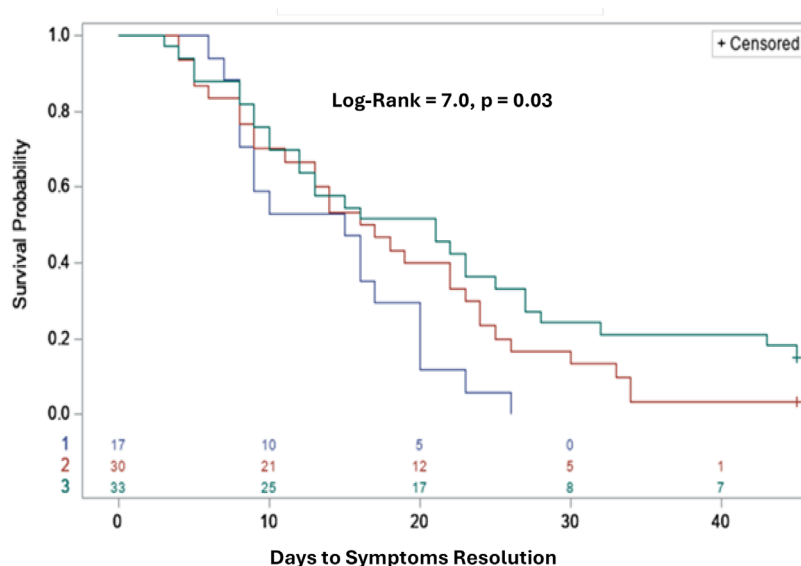


Figure 2 (a) Non-linear association between median daily screen time and symptom resolution. (b) Kaplan-Meier curves showing symptom resolution in youth categorised by median daily screen time (<120, 120–240, >240 min/day). *Adjusted for sex, age, vision-related symptoms at injury, and average PCS score during the first three days post-injury. The green line represents a group with a median screen time <120 minutes/day in the first 3 days postconcussion, the blue line represents group with a median screen time between 120-240 minutes/day, while the red line represents a group with a median screen time >240 minutes/day.

often occurs through messaging apps, social media and online gaming.^{34 35} More restricted screen engagement with these platforms may increase feelings of loneliness and disconnection.^{32 36 37} Balancing screen time to promote meaningful social interaction while avoiding overstimulation may aid in concussion recovery.⁵

Our findings indicate that post-concussion screen time varied by sex, concussion history, vision-related symptoms and whether the injury was sport-related. Males watched TV more, while females spent more time on smartphones and computers, consistent with previous research.^{23 37} Although we found no age-related differences, earlier studies report that youth aged 8–12 typically spend 4–6 hours per day on screens and teens up to 9 hours. The American Academy of Pediatrics recommends

that screen use in children six and older should not interfere with sleep, physical activity or other healthy behaviours.^{35 38} Additionally, we found that youth with a history of concussions were less likely to use computers or play games. Those with vision-related symptoms watched less TV, while those with non-sport injuries used smartphones and played games less than their peers. These patterns highlight the importance of tailored screen time guidance to individual needs during concussion recovery.^{9 34 39}

Research on optimal screen time during concussion recovery is limited by inconsistent definitions, measurement tools and data collection methods.^{5 6 10 40} Screen time is often treated as a single category, despite varying physiological effects across activities.^{34 37 41} Sanders *et al* proposed classifying screen use into social, passive, interactive, educational and other types.²

Table 2 Cox proportional-hazards models assessing the association between screen time during the first 3 days post concussion and time to symptom resolution

	Reference	HR	95% CI	P value*
Total screen time (min/day)				0.03
120–240	<120	2.27	1.20 to 4.29	
	>240	1.58	0.86 to 2.93	
Smartphone use (min/day)				0.02
120–240	<120	2.47	1.25 to 4.86	
	>240	2.42	1.15 to 5.12	
Watching TV (min/day)				0.01
60–120	<60	1.77	0.73 to 4.25	
	>120	3.10	1.29 to 7.48	
Computer/tablet use				
Yes	No	1.03	0.65 to 1.64	0.89
Gaming				
Yes	No	1.08	0.67 to 1.74	0.74

Statistical significance was defined as $\alpha=0.05$.
*Test of equality over strata for total screen time, smartphone use and watching TV. TV, television.

Definitions also differ: the Oxford English Dictionary defines screen time as “time spent using a device such as a computer, television, or game console,”⁴² while the WHO emphasises sedentary screen time use without physical activity.⁴³ Related terms such as media time and digital media use further complicate standardisation.⁴⁰ Our study addresses some of these gaps by using an objective measure of screen time and examining different types of screen activities during the first week post injury. While our findings add to the limited evidence on screen time and acute concussion recovery in youth, standardised definitions, uniform measurement and randomised controlled trials (RCTs) are needed. Further research should also explore the context and content of screen use to better understand its impact on concussion recovery in youth.²

Clinical implications

This study suggests that moderate screen time—especially smartphone use—between 120 and 240 min/day during the first 3 days post concussion is associated with faster symptom resolution in youth. Both more restricted and prolonged use was associated with slower recovery, supporting the importance of moderation. Rather than advising complete screen avoidance, clinicians may consider recommending a daily screen time target of about 141 min to support recovery. Different types of screen activity may also affect recovery differently. Further research is needed to refine these recommendations.

Limitations

This study has several limitations. First, this study did not measure the content of screen time, screen brightness, resolution, colour settings, the use of blue-light-blocking glasses or participants’ cognitive engagement. These factors may influence cognitive demand or load and could potentially affect concussion recovery. Second, due to privacy restrictions, screen use during school hours was not recorded, resulting in missing data. Although Narrative Clip wear times were standardised, there remains the potential for underestimation or overestimation of both total wear time and total screen use time. Third, this study measured total daily screen time but did not consider timing of use or other unmeasured confounders that could affect recovery.

Fourth, our observed relationships between screen time and symptom resolution might be bidirectional, and causation cannot be implied. Finally, the sample size was small and lacked diversity, and participants were recruited from hospital-based emergency department and concussion clinics, which may see more severe injuries or those with more severe symptoms. Therefore, our findings may not generalise to concussed children treated in primary care or other community settings or to those younger than 10 years.

CONCLUSIONS

This study examined the association between screen time and type during the first week post concussion and symptom resolution in youth. Findings indicate that in this group of 80 youth, moderate screen use, particularly smartphone use, between 120 and 240 min/day, was associated with faster recovery, while both higher and lower use were associated with delayed symptom resolution. These findings suggest that, instead of advising complete screen avoidance, clinicians may better support recovery by guiding youth towards a balanced target of about 141 min of daily screen time in the first 3 days post concussion. Further research, including RCTs, is needed to validate these findings and explore the impact of specific screen activities on concussion recovery.

Acknowledgements The authors thank the ReAct Clinical Study Group and Certified Athletic Trainers and Clinical Research Coordinators at Nationwide Children’s Hospital who assisted in participant recruitment and data collection for this project. They also want to express appreciation to Donna Hull and Lisa Kluchurosky who helped coordinate various study activities. Finally, they want to acknowledge the invaluable contributions of the families who were involved in this project.

Contributors JY, EA and ND: Concept and design. JY, ND and TP: Acquisition of the data. EA, JY and KOY: Statistical analysis. JY, EA, KOY, KKW, TP and GAS: Interpretation of the data. ND, JY, EA and KKW: Drafting the manuscript. All authors contributed to critical revision of the manuscript for important intellectual content. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work. JY is the guarantor.

Funding Research reported in this publication was partially supported by the Eunice Kennedy Shriver National Institute of Child Health & Human Development of the National Institutes of Health (R21HD086451). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the Chronic Brain Injury Program.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by the Nationwide Children’s Hospital Institutional Review Board (IRB16-00613). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available on reasonable request. JY has full access to all study data and takes responsibility for the integrity of the data and the accuracy of the data analysis. The datasets generated and/or analysed during the current study are available from JY on reasonable request. Raw data are not available due to parameters indicated in the participant consent materials.

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