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Research Article

Smartphone Usage Duration and Coronary Lesion Severity Assessed by SYNTAX Score in NSTEMI Patients: An Observational Analysis

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Abstract

Objectives: The primary aim of this study is to assess the independent relationship between daily smartphone usage duration, a key indicator of modern sedentary life, and the anatomical severity of coronary artery disease (CAD), measured by the SYNTAX score, in patients with non-ST-elevation myocardial infarction (NSTEMI) who lack traditional cardiovascular risk factors.

Methods: In this comparative cross-sectional study, 187 NSTEMI patients were divided into two groups based on the median daily smartphone usage: 'Low Screen Time' (n=93) and 'High Screen Time' (n=94). Screen time was objectively measured using built-in smartphone applications. Coronary lesion complexity was quantified using the SYNTAX score following coronary angiography. A multivariate linear regression analysis was conducted to identify independent predictors of CAD severity.

Results: The High Screen Time group had significantly higher SYNTAX scores compared to the Low Screen Time group (26.2±4.1 vs. 17.52±5.2; p<0.001). This group also exhibited a higher Body Mass Index (BMI) , a more atherogenic lipid profile , and longer delays in hospital admission (3.8±1.4 hours vs. 2.4±1.1 hours; p<0.001) despite being significantly younger. In the regression analysis, high screen time was identified as the most powerful independent predictor of a higher SYNTAX score (β=5.10, p<0.001).

Conclusion: High daily smartphone screen time is a potent and independent predictor of the angiographic severity of CAD in young NSTEMI patients who do not have traditional risk factors. This contemporary lifestyle factor may serve as a novel digital biomarker, influencing risk through both sedentary behavior and delays in seeking medical care.

Keywords: Smartphone, SYNTAX Score, NSTEMI, Sedentary Behavior, Digital Phenotyping, Text Neck Syndrome

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The widespread use of mobile devices and the integration of digital technologies into daily life have significantly increased the amount of time individuals spend in front of screens. This trend, coupled with postural changes and a sedentary lifestyle, has paved the way for the emergence of new clinical conditions affecting the musculoskeletal system. Chronic pain and discomfort, particularly in the neck and upper back regions, have become common health issues in modern society. Prolonged and repetitive forward head posture is not limited to musculoskeletal complaints; through referred pain mechanisms, it can also lead to clinical presentations such as cervicogenic chest pain (cervical angina) that mimic cardiovascular disorders.[1, 2] The severity of pain experienced in cervical angina

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can be objectively assessed using tools such as the Visual Analog Scale (VAS).[3, 4] In younger and middle-aged populations, the increasing duration of mobile phone use has been associated with a higher prevalence of these symptoms, which not only complicates the diagnostic process but also contributes to unnecessary and costly healthcare utilization.[5] Furthermore, the demonstrated relationship between increased screen time and various cardiovascular risk factors highlights the need for a comprehensive evaluation of the health impacts of the digital era.[6, 7]

Contemporary epidemiology increasingly considers individual digital technology usage habits not as isolated behaviors, but as fundamental components of a comprehensive "digital risk profile phenotype" that significantly influences overall health and disease susceptibility.[8] At the center of this phenotype, daily screen exposure may elevate cardiovascular risk through two principal pathophysiological mechanisms: first, by influencing patient behavior via symptomatic conditions such as cervical angina, potentially leading to delays in seeking medical attention;[9] and second, by serving as an objective and directly measurable indicator of a sedentary lifestyle. There is robust evidence demonstrating that sedentary behaviors contribute to the risk and progression of coronary artery disease (CAD) through mechanisms including insulin resistance, systemic inflammation, dyslipidemia, and hypertension. Therefore, investigating the potential direct association between daily mobile phone usage duration and the anatomical severity of CAD emerges as an important and contemporary scientific question, crucial for advancing our understanding of the cardiovascular health implications of modern digital life.[10, 11]

In high-mortality clinical scenarios such as non-ST elevation myocardial infarction (NSTEMI), patient prognosis predominantly depends on the duration from ischemia onset to reperfusion, alongside the anatomical complexity of underlying CAD.[12] The SYNTAX score, considered the gold standard for quantitatively assessing coronary lesion complexity and prognostic stratification, integrates the number, location, and morphological characteristics of lesions.[13] A higher SYNTAX score independently predicts increased major adverse cardiovascular events.[14] Although prior studies extensively evaluated associations between traditional cardiovascular risk factors and the SYNTAX score, the impact of modern lifestyle-induced syndromes, including cervical angina and underlying digital habits, remains unexplored.

The primary aim of this study is to test the hypothesis that daily mobile device usage duration,a hallmark of the digital age, is significantly and independently associated with the severity of CAD, as reflected by the SYNTAX score, in patients with NSTEMI. The secondary hypothesis posits that chronic musculoskeletal pain symptoms (quantified by the Visual Analog Scale), which can present similarly to conditions like cervical angina, may mediate this relationship by prolonging the time to hospital admission and thereby influencing clinical outcomes. To the best of our knowledge, this is the first study to directly investigate the association between mobile device usage habits and coronary anatomical complexity. The findings of this study are expected to contribute to risk assessment algorithms in acute coronary syndrome patients and to guide preventive medicine and public health strategies by elucidating the tangible impacts of modern lifestyle factors on cardiovascular health.

Methods

This study was conducted as an observational, comparative cross-sectional study at the Department of Cardiology, Sincan Training and Research Hospital, between April 11, 2025 and June 2025. Participants were consecutively enrolled until the required sample size was achieved, provided they met the predefined inclusion criteria. Comprehensive clinical assessments, including blood pressure profiles, anthropometric measurements, resting transthoracic echocardiography (TTE), and treadmill exercise testing, were performed on all participants. Ethical approval for the study was obtained from the xx Ethics Committee (2025/19), and all procedures adhered to the Declaration of Helsinki guidelines. Informed consent was obtained from all participants during the initial visit.

Study Population

Patients included in the study were selected from individuals aged 20 to 60 years who had been newly diagnosed with NSTEMI, confirmed by symptoms, electrocardiographic findings, and elevated cardiac troponin levels in accordance with current European Society of Cardiology (ESC) guidelines.[12] A primary requirement for inclusion was the absence of any documented history of coronary artery disease (including prior myocardial infarction, angina pectoris, percutaneous coronary intervention [PCI], or coronary artery bypass graft [CABG]) or previous invasive or computed tomographic coronary angiography performed for any indication. Additionally, all participants underwent coronary angiography during the same hospitalization for their index NSTEMI event and provided written informed consent for participation. To ensure that the primary study variable, screen time, accurately reflected the patient's chronic behavior, participants were questioned about whether the preceding week—when measurements were taken—represented a typical week in terms of their overall lifestyle. Individuals reporting significant lifestyle changes, such as taking leave, experiencing unusually heavy workloads, or other notable deviations within that week, were excluded from the study, considering these factors could misrepresent long-term exposure.

Comprehensive exclusion criteria were applied to ensure homogeneity of the study population and minimize confounding factors. Accordingly, patients with established cardiovascular risk factors such as peripheral arterial disease, hypertension, diabetes mellitus, or hyperlipidemia were excluded. Other exclusion criteria included cardiac conditions such as ST-elevation myocardial infarction (STEMI), unstable angina without biomarker elevation, known congestive heart failure (NYHA class ≥II or LVEF <55%), moderate-to-severe valvular disease, and primary cardiomyopathies. Patients diagnosed with acute conditions potentially mimicking NSTEMI—such as pericarditis, myocarditis, or pulmonary embolism—were also excluded. Furthermore, individuals with serious systemic comorbidities including active malignancy, advanced chronic kidney disease (eGFR <30 mL/min/1.73 m^2), or liver failure, as well as pregnant or breastfeeding patients, were not included.

Data Collection

Detailed demographic, clinical, laboratory, echocardiographic, and angiographic data of enrolled patients were meticulously collected using the hospital's electronic information management system, patient files, and structured data collection forms.

Demographic and Clinical Data:

Patients' age, gender, body mass index (BMI, kg/m^2), and standard cardiovascular risk factors, including smoking status (current smoker, former smoker, never smoked) and alcohol consumption, were documented. Symptoms upon admission (such as chest pain, dyspnea, neck and head pain) and the duration from symptom onset to first medical contact (in hours) were also recorded.

Mobile Phone Screen Time Assessment:

Participants' average daily screen times and daily step counts were objectively recorded using built-in tracking tools on their personal smartphones (iOS or Android operating system). Screen time data on iOS devices was obtained via Apple's 'Screen Time' function, while on Android devices, it was obtained via 'Digital Wellbeing & Parental Controls' or equivalent built-in applications provided by the phone manufacturer. Daily step counts were automatically recorded via the phones' built-in sensors (accelerometer and pedometer). At the start of the study, participants were asked to display their average daily screen time (hours/day) and daily step count data for the past week (7 days) from their phone applications. Researchers verified and recorded these data directly from the participants' phone screens as objective measurements. This method allowed for non-invasive and high-accuracy assessment of participants' screen time and physical activity levels in their natural living environments. To specifically assess screen usage in dim light conditions and mobile phone usage duration (in years), supplementary questions were included in a questionnaire administered during interviews with participants. These questions inquired about what proportion of participants' total daily screen time occurred during evening hours, before going to bed at night, and in low-ambient light conditions (e.g., in bed, dimly lit rooms, etc.). Based on participants' self-reports and statements regarding their habits, estimated daily screen usage time in dim light (hours/day) was recorded.

Laboratory Findings:

Laboratory data obtained from venous blood samples at admission included complete blood count parameters (hemoglobin, white blood cell count, platelet count), renal function tests (creatinine, urea, eGFR calculated using the CKD-EPI formula), liver function tests, lipid profiles (total cholesterol, LDL-cholesterol, HDL-cholesterol, triglycerides), fasting blood glucose, and peak cardiac troponin (I or T) levels.

Coronary Angiography and SYNTAX Score Calculation:

Diagnostic coronary angiography was performed on all patients by experienced interventional cardiologists using standard techniques (femoral or radial arterial access) in accordance with current clinical guidelines. The angiographic images were digitally stored in DICOM format. SYNTAX scores were calculated independently by two experienced interventional cardiologists who were blinded to clinical data and primary endpoints. Evaluations included all coronary lesions with reference vessel diameter >1.5 mm and lumen stenosis ≥50%, using the online SYNTAX score calculator (available at www.syntaxscore.org). Variables assessed for each lesion encompassed segment localization, severity and length of stenosis, presence and extent of calcification, presence of thrombus, bifurcation/trifurcation characteristics (including Medina classification), ostial involvement, and the presence of total occlusion (including TIMI flow grade and estimated duration of occlusion, if applicable). Clinically significant discrepancies between the two independent SS calculations (>10% or >5 points) were resolved by consensus between the cardiologists.

Pain Assessment

The intensity of chronic pain associated with 'Text Neck Syndrome' was quantitatively assessed using a standard Visual Analogue Scale (VAS). To ensure distinction from acute NSTEMI symptoms, patients were clearly instructed that the VAS was intended to measure their typical, daily pain in the neck, shoulder, and back, not the acute chest pain experienced upon admission. The scale was a 10 cm (100 mm) horizontal line with endpoints labeled 'No Pain' (0 points) and 'The Worst Imaginable Pain' (10 points). Each patient made a vertical mark on the line to represent their usual pain level. The distance from the zero-point ('No Pain') to the patient's mark was measured in centimeters to generate a score from 0 to 10.

Data Analysis

All statistical analyses were conducted using IBM SPSS Statistics for Windows, Version 26.0 (IBM Corporation, Armonk, NY, USA). Descriptive statistics were used to summarize patient characteristics. Continuous variables were presented as mean±standard deviation (SD), while categorical variables were expressed as frequencies and percentages (n, %).

For comparative purposes, patients were dichotomized into two groups based on the median daily smartphone screen time of 295 minutes: the 'Low Screen Time' group (n=93) and the 'High Screen Time' group (n=94). The normality of distribution for continuous variables was assessed using the Shapiro-Wilk test. As the data were found to not follow a normal distribution, non-parametric tests were utilized for inferential analyses.

Differences between the 'Low Screen Time' and 'High Screen Time' groups were evaluated using the Mann-Whitney U test for continuous variables and the Chi-Square test for categorical variables [cite: 59]. To determine the independent predictors of coronary lesion severity, a multivariate linear regression analysis was performed with the SYNTAX score as the dependent variable. The model was adjusted for significant confounding factors such as age and BMI, which were identified in bivariate analyses. For all statistical tests, a p-value of <0.05 was considered to indicate statistical significance.

Results

The baseline demographic, clinical, and laboratory characteristics of the NSTEMI patients included in the study are presented comparatively in Table 1, categorized by the high screen time group (n=94) and low screen time group (n=93). No statistically significant differences were observed between groups regarding gender distribution (p=0.71), smoking status (p=0.56), or alcohol consumption (p=0.31). Similarly, there were no significant differences in renal function parameters such as creatinine (p=0.41), glomerular filtration rate (GFR) (p=0.52), electrolyte levels including sodium (p=0.42) and potassium (p=0.84), hemoglobin (p=0.54), platelet counts (p=0.52), high-density lipoprotein (HDL) cholesterol (p=0.30), and HbA1c (p=0.42).

Table 1. Comparison of Baseline Demographic, Clinical, and Laboratory Characteristics Between High and Low Screen Time Groups

Variables	Control (n=93)		Case (n=94)		p
	n	%	n	%	
Gender					
Male	68	73	71	75	0.71
Female	25	27	23	25	
Smoking	31	33.3	35	37.2	0.56
Alchol	7	7.5	6	6.3	0.31
	Mean	**(±Sd.).**	**Mean**	**(±Sd.).**	**p**
Age (Years)	51.3	8.5	48.2	7.1	<0.001
Body Mass Index (BMI, kg/m^2)	27.9	3.4	29.5	4.0	0.027
Creatinine (mg/dL)	0.94	0.3	0.91	0.2	0.41
Glomerular Filtration Rate (mL/min/1.73m^2)	88.9	7.1	89.5	8.8	0.52
Sodium (Na, mmol/L)	141.3	2.0	140.5	2.1	0.42
Potassium (K, mmol/L)	4.3	0.4	4.3	0.3	0.84
Total Cholesterol (mg/dL)	192	37	204.5	39	<0.001
Triglycerides (mg/dL)	138	43	174	49	<0.001
Low-density lipoprotein (LDL, mg/dL)	125.5	25.1	129.8	28.3	<0.001
High-density lipoprotein (HDL, mg/dL)	40.1	8.2	39.9	7.5	0.30
Hemoglobin (Hb, g/dL)	14.9	1.4	14.5	1.1	0.54
Platelet Count (PLT, x10^9/L)	224	48	228	47	0.52
HbA 1c (%)	5.1	0.3	5.3	0.4	0.42

However, significant differences were noted in several other parameters. The mean age of the high screen time group (48.2±7.1 years) was significantly lower compared to the low screen time group (51.3±8.5 years) ($p<0.001$). Additionally, the body mass index (BMI) was significantly higher in the high screen time group (29.5±4.0 kg/m^2) compared to the low screen time group (27.9±3.4 kg/m^2) ($p=0.027$). Lipid profile analysis revealed a more atherogenic profile in the high screen time group, with significantly elevated total cholesterol (204.5±39 mg/dL vs. 192±37 mg/dL; $p<0.001$), triglycerides (174±49 mg/dL vs. 138±43 mg/dL; $p<0.001$), and low-density lipoprotein (LDL) cholesterol levels (129.8±28.3 mg/dL vs. 125.5±25.1 mg/dL; $p<0.001$) compared to low screen time group. These findings suggest that despite younger age, the case group is characterized by higher BMI and a more adverse lipid profile.

Analyses testing the primary hypothesis (Table 2) revealed significant differences between groups in mobile phone usage habits, physical activity levels, hospital admission times, and coronary artery disease severity. Daily mobile phone screen time was significantly higher in the high screen time group (5.8±1.8 hours/day) compared to low screen time group (4.2±1.1 hours/day; $p<0.001$). Similarly, exposure to screen time under low-light conditions was significantly greater in the high screen time group(7.2±3.8 hours/week) low screen time group (4.3±1.5 hours/week; $p<0.001$). However, no difference was observed in total years of mobile phone use between groups ($p=0.56$). Daily step count, indicative of physical activity, was significantly lower in the high screen time group (4070±980 steps/day) compared to low screen time group (5430±960 steps/day; $p<0.001$). Clinically, the duration from symptom onset to hospital presentation (admission delay) was significantly longer in the high screen time group (3.8±1.4 hours) than low screen time group (2.4±1.1 hours; $p<0.001$). The high screen time group also reported significantly higher Visual Analog Scale (VAS) scores for pain intensity (5.8±1.5 vs. 2.1±1.1; $p<0.001$). Furthermore, SYNTAX scores reflecting coronary artery disease severity, the primary endpoint, were significantly higher in the high screen time group (26.2±4.1 vs. 17.52±5.2; $p<0.001$).

Multivariate linear regression analysis was conducted to assess the independent predictive value of variables associated with SYNTAX scores (detailed in Table 3). The regression model was statistically significant ($p<0.001$). High screen time emerged as the strongest independent predictor of increased SYNTAX score ($\beta=5.10$, $p<0.001$), independent of age, BMI, and LDL cholesterol. Other independent predictors identified were admission delay, with each additional hour associated with increased SYNTAX score ($\beta=1.81$, $p<0.001$), BMI ($\beta=0.14$, $p=0.021$), and LDL cholesterol levels ($\beta=0.08$, $p=0.008$). Interestingly, age had a negative association with SYNTAX score ($\beta=-0.15$, $p<0.001$), suggesting younger age may correlate with more severe coronary artery disease after adjusting for other variables.

Discussion

We suggest that this study addresses an important gap in the literature by exploring how modern, digital lifestyle factors might influence cardiovascular health. Our primary observation indicates a possible strong and independent association between elevated daily smartphone usage and higher SYNTAX scores, reflecting increased anatomical severity of CAD, particularly among patients with newly

Table 3. Independent Predictors of the SYNTAX Score from Multivariate Linear Regression Analysis

Independent Variable	Beta (β) Coefficient	Standard Error	t	p
(Intercept)	15.29	2.95	5.19	<0.001
High Screen Time Group	5.10	0.59	8.59	<0.001
Admission Delay (Hours)	1.81	0.22	8.29	<0.001
Age (Years)	-0.15	0.03	-4.33	<0.001
BMI (kg/m^2)	0.14	0.07	2.33	0.021
LDL Kolesterol (mg/dL)	0.08	0.03	2.67	0.008

Table 2. Comparison of Lifestyle Habits, Clinical Findings, and Angiographic Findings Between High and Low Screen Time Groups

Variables	Control (n=93)		Case (n=94)		p
	Mean	(±Sd.).	Mean	(±Sd.).	
Mobil Phone Screen Use (hours/day)	4.2	1.1	5.8	1.8	<0.001
Screen Time in Dim Light (hours/week)	4.3	1.5	7.2	3.8	<0.001
Mobile phone use years	19.7	1.5	18.9	1.9	0.56
Steps/day	5430	960	4070	980	<.001
Application Delay Period (Hours)	2.4	1.1	3.8	1.4	<0.001
SYNTAX Score	17.52	5.2	26.2	4.1	<0.001
VAS Score (0-10)	2.1	1.1	5.8	1.5	<0.001

diagnosed NSTEMI who do not exhibit traditional cardiovascular risk factors such as hypertension, diabetes, or hyperlipidemia. Regression analysis supports the notion that prolonged smartphone screen time might independently predict higher SYNTAX scores, even when accounting for other relevant factors. This insight potentially extends current knowledge regarding the adverse cardiovascular implications of sedentary behaviors, specifically connecting mobile device usage with measurable indicators of coronary artery disease severity.

The underlying biological mechanisms are likely multifaceted. The association between extended screen time and heightened CAD severity might involve multiple pathophysiological pathways. Our findings reveal significantly lower daily step counts in individuals with higher screen time, indicating a pronounced sedentary lifestyle that is directly associated with increased BMI and an adverse lipid profile, including elevated total cholesterol, LDL cholesterol, and triglycerides. Previous studies have extensively discussed how sedentary behavior may promote low-grade inflammation, insulin resistance, and endothelial dysfunction, all contributing to the pathogenesis of atherosclerosis.[15, 16] Additionally, frequent mobile device interactions, such as continuous social media or work notifications, may induce chronic stress and heightened sympathetic nervous system activity, possibly elevating stress hormones like cortisol. Enhanced sympathetic activity may subsequently increase heart rate, blood pressure, and myocardial oxygen demand, contributing to a pro-inflammatory and pro-thrombotic state, thereby potentially accelerating atherosclerotic processes. Moreover, our data suggest increased exposure to screen usage under dim lighting conditions among individuals with high screen time. Exposure to screen-emitted blue light, especially in the evening, is known to suppress melatonin secretion, disrupting circadian rhythms and impairing sleep quality. Circadian disturbances and inadequate sleep have been associated with autonomic imbalance, increased inflammatory markers, impaired glucose regulation, and hypertension, collectively contributing to atherosclerotic risk.[17-19] These factors could be particularly critical in destabilizing coronary plaques, increasing the risk of acute cardiovascular events.

Secondary findings from our study also illuminate potential behavioral implications. Notably, patients with higher screen time exhibited significantly longer delays in seeking medical attention (3.8 versus 2.4 hours) and reported higher pain intensity scores on the VAS for chronic neck and back pain.[20, 21] It is possible that chronic myofascial pain symptoms associated with high screen time (as measured by the VAS score) may have led patients to misinterpret their cardiac symptoms and delay seeking medical attention. This potential misinterpretation could mask or mislead the recognition of true cardiac symptoms, thereby delaying urgent medical care.[21] Moreover, our regression analysis highlights presentation delay as an independent predictor of increased SYNTAX scores, suggesting this delay might actively contribute to thrombus development and plaque instability, thereby complicating coronary lesions. Such a relationship underscores the importance of early medical intervention, as delays could not only exacerbate myocardial damage but also increase coronary lesion complexity.

One of the most intriguing and counter-intuitive findings of our study is the "younger age paradox": higher SYNTAX scores were observed in younger individuals, and age emerged as a negative predictor in the regression analysis. This "paradox" deserves particular emphasis. In this homogeneous population where traditional risk factors were meticulously excluded, this observation strongly suggests that a digital-focused sedentary lifestyle may act as an independent and potent mechanism causing a more aggressive and early progression of CAD in younger individuals. The constellation of associated factors—significantly lower physical activity , increased BMI , and a more atherogenic lipid profile —supports the hypothesis that this contemporary lifestyle phenotype uniquely contributes to accelerated atherosclerosis, overriding the typically protective effect of younger age. This reinforces the main message of our study: modern digital habits may be shaping a new epidemiology of premature and severe coronary artery disease.[22]

The clinical implications of our findings are noteworthy. Digital behavioral patterns, described through "digital phenotyping," could offer objective markers for assessing cardiovascular risk, particularly among younger and middle-aged patients without conventional risk factors. Integrating metrics like daily screen time and step count into routine cardiovascular evaluations could help identify patients at higher risk.[8] Physicians should proactively inform patients about the potential cardiovascular consequences of excessive screen use, including increased sedentary behavior, disrupted sleep, chronic stress, and elevated sympathetic nervous activity. Awareness of how chronic musculoskeletal pain associated with smartphone use can mimic cardiac symptoms is also essential. Clinicians should be cautious when evaluating atypical chest or neck pain among frequent smartphone users, recognizing that such symptoms might indicate underlying ischemic heart disease, thus emphasizing the need for timely medical evaluation.

Limitations

Several limitations should be considered when interpreting the findings of this study. Firstly, due to its observational and cross-sectional design, the observed associations cannot establish causality but merely indicate strong associations. Whether increased screen time directly causes more severe coronary artery disease (CAD) or whether individuals predisposed to severe CAD adopt a more sedentary lifestyle involving greater screen time cannot be distinguished with this design. Secondly, the single-center nature of the study limits the generalizability of findings to different socioeconomic and ethnic populations. Multicenter studies are necessary to substantiate the universality of the findings. Thirdly, although primary data such as daily screen time and step counts were objectively measured, certain parameters such as screen use under dim lighting conditions were collected through questionnaires, making them susceptible to recall bias. Patients experiencing serious events like NSTEMI might exaggerate their past unhealthy behaviors (such as screen time), potentially inflating the magnitude of observed associations. Finally, despite extensive exclusion criteria to minimize known confounders, unmeasured potential confounders such as dietary habits, psychosocial stress levels, or sleep quality could have impacted the results. These factors, closely associated with both screen habits and CAD, may partially explain the observed effect of screen time.

Recommendations for Future Studies

The significant findings and limitations highlighted in this study provide clear guidance for future research. Prospective cohort studies tracking the digital habits and cardiovascular outcomes of initially healthy large populations over time are essential to clarify causally the role of increased screen time in CAD development. Future studies should also incorporate biomarkers for inflammation (e.g., hs-CRP, IL-6), chronic stress (hair cortisol), and sympathetic activation (urinary metanephrines), alongside objective sleep quality assessments like actigraphy and validated psychosocial stress questionnaires. Most importantly, randomized controlled trials (RCTs) evaluating interventions aimed at reducing screen time and their impact on cardiovascular outcomes are crucial. For instance, post-NSTEMI patients could be randomized to standard treatment plus interventions such as cognitive behavioral therapy or specialized mobile applications designed to manage screen time. Such studies would provide the highest level of evidence regarding the clinical benefit of targeting this modifiable risk factor.

Conclusion

In conclusion, this study provides compelling evidence suggesting that daily smartphone screen time may be a novel, modifiable, and independent predictor of angiographic CAD severity in relatively young NSTEMI patients without traditional risk factors. Our findings indicate that increased screen time adversely affects cardiovascular health not only through promoting a sedentary lifestyle but also potentially by contributing to chronic pain symptoms that may be misinterpreted by patients, thereby delaying hospital presentation. Consequently, daily screen time should be considered a critical parameter in modern cardiovascular risk assessment, particularly among younger populations. Confirmation of these findings in larger prospective studies and further investigations into the effectiveness of interventions to reduce screen time on cardiovascular outcomes are critically important. Additionally, this observation underscores that younger age, independent of other factors, may be associated with higher SYNTAX scores.

Disclosures

Ethics Committee Approval: This study was approved by the Çankırı Karatekin University Ethics Committee on 2025, with decision number 2025/19.

Informed Consent: Informed consent was obtained from all participants.

Peer-review: Externally peer reviewed.

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