Effect of Smartphone Usage on Neck Muscle Endurance, Hand Grip and Pinch Strength among Healthy College Students: A Cross-Sectional Study

by

Adel Alshahrani 1 , Mohamed Samy Abdrabo 1,2, Sobhy M. Aly 1,3, Mastour Saeed Alshahrani 4 , Raee S. Alqhtani 1 , Faisal Asiri 4,* and Irshad Ahmad 4

1 Department of Medical Rehabilitation Sciences-Physiotherapy Program, College of Applied Medical Sciences, Najran University, Najran 55461, Saudi Arabia;

2 Department of Basic Sciences, Faculty of Physical Therapy, Cairo University, Cairo 12613, Egypt

3 Department of Biomechanics, Faculty of Physical Therapy, Cairo University, Cairo 12613, Egypt

4 Department of Medical Rehabilitation Sciences, College of Applied Medical Sciences, King Khalid University, Abha 62529, Saudi Arabia;

Abstract (300 word limit)

In recent years, there has been a significant increase in global smartphone usage driven by different purposes. This study aimed to explore the effect of smartphone usage on neck muscle (flexors and extensors) endurance, hand grip, and pinch strength among young, healthy college students. In total, 40 male students were recruited for this study; 20 of them belonged to the smartphone-addicted group, while the other 20 were in the non-addicted group based on their smartphone addiction scale—short version (SAS-SV) scores (the threshold for determining smartphone addiction: 31/60). Neck flexor endurance time, the ability to perform a neck extensor muscle endurance test, and hand and pinch grip strength were assessed. Multivariate analysis of variance (MANOVA) was used to assess between-group differences in the mean values of neck flexor endurance time, hand grip, and pinch grip. A significant group effect (Wilks' lambda = 0.51, F (5,34) = 6.34, p = 0.001, partial eta squared = 0.48) was found. A decrease in neck flexor endurance time was observed in the smartphone-addicted group compared with that of the non-addicted group ($p < 0.001$). However, there was no notable difference in the neck extensor muscle endurance test or in hand grip and pinch grip strength of both hands between groups ($p > 0.05$). Using a smartphone for a prolonged time might affect neck flexor muscle endurance; however, more research is needed to explore the long-term effects of using smartphones on neck muscle endurance and hand/pinch grip strength and the risk of developing upper limb neuromusculoskeletal dysfunction.

Keywords:

smartphone addiction; hand grip; neck muscle endurance; neck flexors; neck extensors

help this recognition.

Image

Table 1. Between-group comparison of participants' characteristics.

	Smartphone-Addicted Group	Non-Smartphone-Addicted Group	p Value
	Mean ± SD	Mean ± SD	
Age (years)	21.8 ± 1.6	22.3 ± 1.45	0.30
Weight (kg)	69.2 ± 7	67.5 ± 7.97	0.47
Height (cm)	173.25 ± 3.2	174.05 ± 4.65	0.53
BMI (kg/m²)	23.04 ± 2.11	22.37 ± 3.34	0.45
SAS-SV scores	37.35 ± 3.23	27.2 ± 2.3	0.001
Dominant hand			
Right	18 (90%)	19 (95%)	0.54
Left	2 (10%)	1 (5%)	
Preferred hand for smartphone use			
Dominant hand	13 (65%)	17 (85%)	0.34
Both hands	7 (35%)	3 (15%)	

x̄, mean; SD, standard deviation; p value, level of significance.

Table 2. Between-group comparisons of neck flexor endurance time, hand grip, and pinch strength.

	Smartphone-Addicted Group	Non-Smartphone-Addicted Group		
	Mean ± SD	Mean ± SD	MD (95% CI)	p Value
Flexor endurance time (s)	14.45 ± 3.95	20.3 ± 2.84	−5.85 (−8.05, −3.64)	0.001
Hand grip strength (kg)				
Dominant hand	21.85 ± 5.2	24.4 ± 4.82	−2.55 (−5.76, 0.66)	0.11
Non-dominant hand	20.05 ± 4.97	21.35 ± 3.82	−1.3 (−4.14, 1.54)	0.36
Pinch grip strength (kg)				
Dominant hand	4.25 ± 1.11	4.6 ± 1.09	−0.35 (−1.05, 0.35)	0.32
Non-dominant hand	3.45 ± 0.75	3.65 ± 0.93	−0.2 (−0.74, 0.35)	0.46

x̄ mean; SD, standard deviation; MD, mean difference; CI, confidence interval; p value, level of significance.

Recent Publications (minimum 5)

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Photograph

Biography (150 word limit)

Dr Alshahrani is Associate Professor and Physiotherapy consultant at Najran University in Saudi Arabia. His specialty in balance and vestibular rehabilitation. He has built this model after years of experience in research, evaluation, teaching and administration both in hospital and education institutionsHe is working as Vise-Rector for Development & Quality for International Rankings Advisor and Vise-Dean for Development & Quality in College of Applied Medical Sciences. He is working as Academic quality Reviewer in the National Center of Assessmnet and Academic Accredation (NCAAA) in Saudi Arabia. He has many publications and research papers in the

field of physiotherapy.

Email:
amsalshahrani@nu.edu.sa

Notes/Comments:

This paper has been published in 2021 IJERPH | Free Full-Text | Effect of Smartphone Usage on Neck Muscle Endurance, Hand Grip and Pinch Strength among Healthy College Students: A Cross-Sectional Study (mdpi.com)