



MOBILE USE AND ITS ANATOMICAL IMPACT ON THE HAND AND FINGER- UNDERSTANDING THE POTENTIAL PROBLEMS

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ABSTRACT

With the widespread adoption of mobile devices, concerns about their potential impact on human health have emerged. This study delves into the anatomical repercussions of mobile use on the hand and finger. Through a comprehensive review of existing literature, it examines the potential problems associated with prolonged smartphone and tablet interaction, including musculoskeletal strain, repetitive stress injuries, and nerve compression. Understanding these issues is crucial for devising effective ergonomic guidelines and preventive strategies to promote healthy mobile device use and mitigate adverse anatomical effects.

Keywords: Mobile use, Anatomical impact, Potential problems, Musculoskeletal health, Repetitive stress injuries, Nerve compression.

INTRODUCTION

The advent of mobile technology has revolutionized the way we communicate, work, and access information, resulting in widespread adoption and dependence on mobile devices such as smartphones and

tablets. These portable devices have become an integral part of modern life, allowing us to stay connected and productive while on the move. However, the increased and prolonged use of mobile devices has

raised concerns about its potential anatomical impact on the hand and fingers.

As we interact with our mobile devices through touchscreens, our hands and fingers are subjected to repetitive and often awkward movements, which can lead to various musculoskeletal problems. This introduction seeks to explore the potential problems associated with mobile use and its impact on the hand and finger anatomy, shedding light on the importance of understanding these issues to maintain optimal hand health in this digital age.

AIM OF STUDY

The aim of this study is to investigate and comprehend the anatomical impact of mobile device use on the hand and fingers, with a specific focus on understanding the potential problems that may arise from prolonged and repetitive interactions with mobile touchscreens. This study contributes to awareness for society and young students.

MATERIALS AND METHODS

Why Smartphone necessary for human.

Smartphones have become necessary for humans due to their wide range of functionalities and capabilities that significantly enhance various aspects of daily life. Here are some key reasons why smartphones are considered necessary for humans:

- **Communication:** Smartphones are powerful communication tools that allow individuals to connect with others through voice calls, text messages, video calls, and various messaging apps. They enable instant and real-time communication, bridging distances and facilitating seamless interaction with family, friends, and colleagues.
- **Information Access:** Smartphones provide immediate access to the internet, offering a vast repository of information at users' fingertips. Whether it's checking the latest news, researching a topic, or seeking answers to queries, smartphones empower individuals with instant access to knowledge.
- **Productivity and Work:** Smartphones have become indispensable for professionals and businesses. With productivity apps, email access, cloud storage, and mobile office suites,

smartphones enable individuals to work on the go, manage tasks, and collaborate with colleagues from virtually anywhere.

- **Entertainment:** Smartphones offer a plethora of entertainment options. Users can stream movies and TV shows, listen to music, play games, read books, and engage with various entertainment apps, providing a diverse range of leisure activities.
- **Navigation and GPS:** Smartphones equipped with GPS technology have become reliable navigation tools. Navigation apps offer real-time directions, traffic updates, and location-based services, helping individuals find their way around unfamiliar areas.
- **Social Connectivity:** Social media platforms are an integral part of modern life, and smartphones are the primary devices for accessing these platforms. They enable users to connect with friends and family, share experiences, and participate in virtual communities.
- **E-commerce and Digital Payments:** Smartphones have revolutionized the way people shop and conduct financial transactions. With e-commerce apps and mobile banking, users can shop online, make digital payments, and manage their finances conveniently.
- **Health and Fitness Tracking:** Smartphones contribute to improved health and fitness management. Health and fitness apps allow users to monitor physical activity, track nutrition, and access personalized wellness programs.
- **Access to Services:** Smartphones provide access to a wide range of services and utilities, including ride-hailing, food delivery, banking, healthcare, and educational resources. They simplify daily tasks and offer convenience in various aspects of life.
- **Emergency Assistance:** Smartphones serve as a lifeline during emergencies. They enable users to make emergency calls, access location services to seek help, and send distress signals through safety apps.

- **Digital Identity:** Smartphones are essential for digital identity verification and authentication in various online services, enhancing security and reducing the risk of identity theft.

Common mistakes while using smartphone ⁽⁰¹⁾

Using smartphones has become an integral part of our daily routines, but certain habits and behaviours related to smartphone usage can have adverse effects on our health. Here are some common mistakes people make while using smartphones that can negatively impact their health:

- **Excessive Screen Time:** Spending long hours staring at the smartphone screen can lead to digital eye strain, causing symptoms like dry eyes, headaches, and blurred vision.
- **Poor Posture:** Holding smartphones at awkward angles or slouching while using them can lead to "text neck" and contribute to neck and back pain.
- **Sleep Disruption:** Using smartphones before bedtime, especially in a dark room, can interfere with sleep patterns due to the blue light emitted by screens, which can disrupt the production of the sleep hormone melatonin.
- **Texting While Walking:** Texting or using smartphones while walking can lead to accidents, falls, and collisions with objects or other pedestrians.
- **Ignoring Wrist Ergonomics:** Constantly using the thumb for texting or navigating the screen without considering wrist ergonomics can lead to repetitive strain injuries like carpal tunnel syndrome.
- **Smartphone Addiction:** Constantly checking the phone for notifications and compulsively using it can lead to smartphone addiction, negatively impacting mental health and social interactions.

- **Ignoring Blue Light Filters:** Not using blue light filter apps or features on smartphones can contribute to eye strain and sleep disturbances.
- **Excessive Gaming:** Prolonged and intense gaming sessions on smartphones can lead to eye strain, hand fatigue, and poor posture.
- **Neglecting Physical Activity:** Spending excessive time on smartphones can lead to a sedentary lifestyle, reducing physical activity and overall fitness.
- **Ignoring Distress Signals:** Ignoring physical discomfort or pain while using smartphones can lead to the development of musculoskeletal issues over time.
- **Not Taking Breaks:** Failing to take regular breaks from smartphone usage can lead to eye strain and mental fatigue.
- **Using Smartphones While Driving:** Engaging with smartphones while driving can lead to accidents and is a significant safety risk.
- **Using Smartphones in Bed:** Using smartphones in bed can negatively impact sleep quality and may disrupt sleep patterns.
- **Not Adjusting Font Size and Brightness:** Using small fonts and high screen brightness can strain the eyes and lead to discomfort.
- **Using Phones While Eating:** Using smartphones while eating can lead to overeating and decreased awareness of portion sizes, contributing to poor eating habits.

Common technique of holding smartphone ⁽⁰²⁾

The way individuals hold their smartphones can vary based on personal preferences and habits. However, there are a few common techniques for holding a smartphone that are widely used refer image no 01.

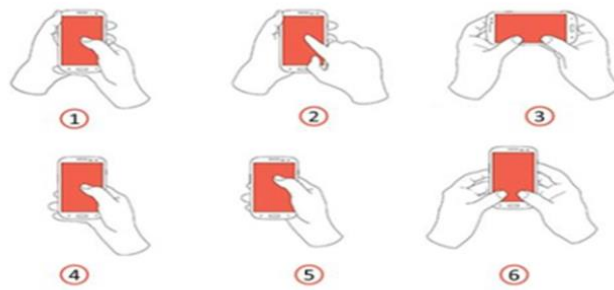


IMAGE 01 – Mobile Holding Techniques

- **One-Handed Grip:** This technique involves holding the smartphone with one hand, usually with the thumb placed on the screen for navigation. The other fingers support the phone from the back, providing stability and control during one-handed use.
- **Two-Handed Grip:** Many people use a two-handed grip for larger smartphones or when typing longer messages. In this technique, the smartphone is held with both hands, and the thumbs are used for typing or navigating the screen.
- **Cradle Grip:** The cradle grip involves holding the smartphone in one hand, with the bottom of the device resting on the palm, and the other fingers wrapped around the back. The thumb is then free to interact with the screen.
- **Pinky Shelf:** This grip is commonly used for larger smartphones, where the pinky finger is used to support the bottom edge of the device, providing additional stability during one-handed use.
- **Landscape Grip:** When watching videos or playing games in landscape orientation, users often hold the smartphone with both hands, placing the thumbs on the sides of the screen for interaction.
- **One-Handed Reach:** In this technique, the user holds the smartphone with one hand and uses the fingers of the same hand to reach different areas of the screen by adjusting the grip or shifting the phone slightly.
- **Thumb Reach:** When holding the smartphone with one hand, the user primarily uses the thumb to navigate and interact with the screen, stretching the thumb to reach different parts of the display.
- **Supportive Palm:** Some users prefer to rest the smartphone against the base of their palm while holding it with one hand, allowing the thumb to reach various areas of the screen comfortably.

Bad impact of using smartphone on Finger and hand. ⁽⁰³⁾

Excessive and improper use of smartphones can have several negative impacts on the hand and fingers. Here are some of the bad effects of using smartphones on the hand:

- **Repetitive Strain Injuries (RSI):** Frequent and prolonged use of smartphones, especially when texting or typing, can lead to repetitive strain injuries such as tendinitis or tenosynovitis. These conditions result from repetitive finger movements and can cause pain, inflammation, and reduced hand mobility.
- **Carpal Tunnel Syndrome:** Holding and using smartphones for extended periods can contribute to carpal tunnel syndrome, a condition where the median nerve in the wrist becomes compressed. This can lead to tingling, numbness, and weakness in the hand and fingers. ⁽⁰⁴⁾ – Refer Image no 02.

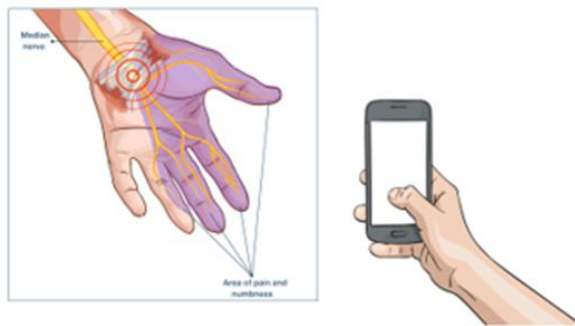


IMAGE02 – Carpal Tunnel Syndrome due to Smartphone

- **Trigger Finger:** Constantly using the fingers to perform precise actions on smartphones can lead to trigger finger, a condition where the finger gets stuck in a bent position and pops or snaps when straightened – Refer image no 03.

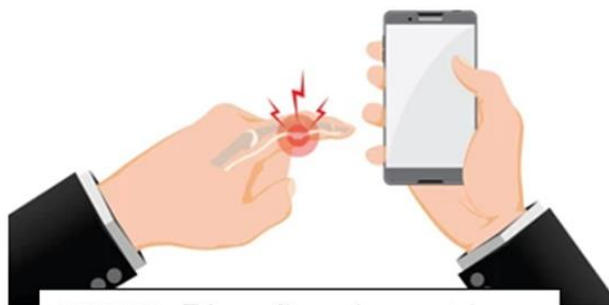


IMAGE03 – Trigger finger due smartphone

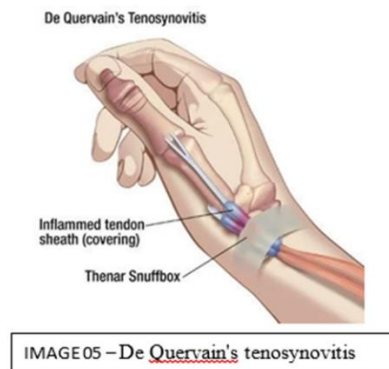
- **Text Neck:** Continuously looking down at smartphones can strain the neck and upper back, leading to text neck, characterized by neck pain, stiffness, and poor posture. ⁽⁰⁵⁾ – refer Image no 04.

HOW IS THE SMARTPHONE DAMAGING YOUR NECK



IMAGE04 – Neck Trauma due smartphone

- **De Quervain's Tenosynovitis:** Frequent texting and swiping on smartphones can cause inflammation of the tendons in the thumb, leading to De Quervain's tenosynovitis, which results in pain and discomfort when moving the thumb. ⁽⁰⁶⁾ – refer image no 05.



- **Thumb Arthritis:** The repetitive and forceful use of the thumb on smartphones can accelerate wear and tear of the thumb joint, leading to the development of thumb arthritis, causing pain and reduced hand function. – refer image no 06



- **Hand Muscle Imbalance:** Using smartphones primarily with one hand or finger can create muscle imbalances in the hand, leading to weakness and potential injury.
- **Reduced Grip Strength:** Overreliance on smartphones and decreased engagement in physical activities can lead to reduced grip strength and hand dexterity. ⁽⁰⁷⁾ – Refer image no 07.



- **Digital Eye Strain:** Prolonged screen time on smartphones can cause digital eye strain, leading to dry eyes, headaches, and eye fatigue. – refer image no 08



IMAGE 08 – Digital Eye Strain Due to Smartphone

- **Thumb and Hand Numbness:** Holding smartphones in certain positions for long periods can compress nerves in the hand, leading to numbness and tingling sensations.
- **Decreased Hand Function:** In severe cases, repetitive smartphone use can lead to decreased hand function, making it challenging to perform everyday tasks.

How we can avoid smartphone bad impact on-health ⁽⁰⁸⁾

To avoid the bad impact of smartphones on the hand and maintain optimal hand health, consider implementing the following practices:

- **Practice Ergonomic Smartphone Use:** Hold the smartphone with a relaxed grip and avoid bending the wrist excessively while using it. Keep the smartphone at eye level to reduce strain on the neck and back.
- **Take Regular Breaks:** Limit the amount of time spent continuously using the smartphone. Take short breaks to rest the hand and fingers and stretch the wrists and fingers during these breaks.
- **Use Speech-to-Text:** Utilize the speech-to-text feature for texting and typing longer messages to reduce the strain on the fingers and thumbs.
- **Alternate Hand Use:** Avoid using only one hand for smartphone interactions. Alternate between using the left and right hand to reduce the risk of overuse injuries.
- **Use a Stylus:** If possible, use a stylus to interact with the smartphone's touchscreen, which can re-

duce direct finger contact and lower the risk of strain.

- **Limit Gaming Sessions:** If gaming on smartphones, set time limits and take breaks to avoid prolonged, repetitive finger movements.
- **Use Larger Screen Devices:** Consider using larger screen devices, like tablets or phablets, as they allow for more comfortable and natural hand movements.
- **Reduce Notifications:** Minimize the number of notifications to avoid constant interaction with the smartphone and reduce the risk of overuse.
- **Practice Hand Exercises:** Incorporate hand and finger exercises regularly to strengthen the muscles and improve flexibility.
- **Use Blue Light Filters:** Apply blue light filters to the smartphone's screen, especially before bedtime, to reduce the impact of blue light on sleep quality.
- **Avoid Smartphone Use While Walking:** Refrain from using the smartphone while walking to prevent accidents and maintain focus on the surroundings.
- **Maintain Overall Health:** Prioritize a healthy lifestyle, including a balanced diet, regular exercise, and sufficient sleep, as this can positively impact hand health.
- **Regularly Evaluate Smartphone Use:** Be mindful of how often and how long you use the smartphone. Consider reducing usage during

non-essential times to prevent excessive strain on the hand.

DISCUSSION

The widespread use of mobile devices, particularly smartphones, has become an integral part of modern life, providing us with communication, information access, and productivity at our fingertips. However, the repetitive and prolonged interactions with mobile touchscreens can have potential anatomical impacts on the hand and fingers.

Frequent texting, swiping, and scrolling on smartphones can lead to repetitive strain injuries (RSI), such as tendinitis and tenosynovitis. Holding smartphones for extended periods may contribute to conditions like carpal tunnel syndrome, causing discomfort and reduced hand function. Additionally, the use of the thumb for typing and swiping can lead to thumb-related issues, like De Quervain's tenosynovitis. Moreover, excessive screen time and constant focus on small screens can lead to digital eye strain and poor neck posture, commonly known as "text neck," further impacting our overall well-being. To promote hand health, it is essential to adopt ergonomic practices, take regular breaks, and be mindful of smartphone usage. By addressing these potential problems, we can maintain a healthier relationship with our mobile devices and ensure better hand and finger function in the digital age.

CONCLUSION

Mobile devices have revolutionized the way we interact with technology and the world around us, but

their excessive and improper use can have detrimental effects on the hand and finger anatomy. Understanding the potential problems associated with mobile use is crucial for promoting responsible smartphone habits and adopting ergonomic practices to safeguard hand health. By being mindful of smartphone usage, taking regular breaks, and incorporating stretching exercises, individuals can mitigate the potential anatomical impact of mobile devices, ensuring a healthier digital experience and overall well-being in the digital age.

REFERENCES

1. <https://mobilesly.com/common-mistakes-while-using-smartphones>
2. <https://www.uxmatters.com/mt/archives/2013/02/how-do-users-really-hold-mobile-devices.php>
3. <https://www.healthline.com/health/smartphone-finger#home-remedies>
4. Gray's Anatomy. The Anatomical Basis of Clinical Practice. 42nd Edition - October 21, 2020. Editor: Susan Standring – Hand Anatomy ,P- 443
5. Gray's Anatomy. The Anatomical Basis of Clinical Practice. 42nd Edition - October 21, 2020. Editor: Susan Standring – Hand Anatomy ,P- 467
6. <https://www.islamicity.org/79091/text-neck-neck-pain/>
7. <https://www.quora.com/What-is-the-smartphone-pinky-syndrome-How-can-I-get-rid-of-the-issue>
8. <https://www.theglobeandmail.com/life/article-five-ways-to-reduce-the-physical-harms-of-smartphone-use/>

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