REVIEW ARTICLE

Smartwatches as Assistive Technology: Evidence and Future Directions

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Abstract
Watches have evolved from simple timekeeping devices into powerful tools supporting daily living. With rapid technological advances, wearable devices increasingly promote independence and comfort. In the United States, adoption has grown substantially, with recent Health Information National Trends Survey data showing that about one in three adults (33%) uses a wearable device, including smartwatches and fitness trackers. This review examines how smartwatches enhance independent living and quality of life, particularly for individuals with functional impairments. Equipped with biosensors, wireless connectivity, and intelligent algorithms, smartwatches function as wearable assistive technologies. They enable real-time health monitoring, activity tracking, emergency alerts, cognitive reminders, medication adherence support, fall detection, and environmental awareness for individuals with sensory impairments. For children and older adults, GPS tracking and connectivity features help maintain caregiver communication. These combined capabilities improve safety, autonomy, and daily routine management. Despite challenges such as limited battery life, sensor accuracy concerns, and data security risks, smartwatches remain promising assistive tools. Future advancements in artificial intelligence, improved sensor integration, and stronger validation may enhance personalization and reliability. As technology evolves, smartwatches are positioned to become integral components of the assistive technology ecosystem, offering accessible and user-friendly solutions that support independence, safety, and effective health management.

Keywords
Smartwatches, Assistive Devices, Activities of Daily Living, Telemonitoring, Wearable Electronic Devices

Introduction
Functional impairment is the inability to fulfill the tasks or roles expected for one's age, gender, and socio-cultural context. This inability results from physical, socio-cultural, or emotional factors. Such impairment usually affects daily life activities and social participation.[1] People with these impairments often need Assistive Technology (AT). AT includes various devices and solutions that improve function and promote independence.[2] In the past, mechanical aids like wheelchairs, hearing aids, and mobility scooters dominated this area. However, in the last decade, the scope of AT has evolved due to digital technologies, smaller electronics, and artificial intelligence (AI). Among these innovations are smartwatches, which increasingly show promise as advanced assistive devices. They are portable and usually multifunctional.[3]

The use of smartwatches in assistive contexts is increasingly supported by studies[4], improved models[5], and higher user adoption[6], which builds their credibility across domains (Table 1).

In low- and middle-income countries (LMICs), where formal assistive technology (AT) services are limited, smartwatches although not yet formally recognized as AT, are increasingly being proposed as potential AT solutions. Their mass-market production and wide retail availability allow them to bypass many of the access barriers associated with traditional AT. In countries such as India, where aging populations and rising disability rates are creating new health demands, positioning smartwatches as part of national AT strategies could have wide-reaching benefits. As mobile internet access continues to expand globally, smartwatch features and applications can be further adapted to meet diverse economic and healthcare needs.[7]

This article critically examines smartwatches in the assistive technology (AT) landscape. It highlights their use in improving activities of daily living (ADLs), enhancing cognitive and sensory support, facilitating communication and awareness, and promoting safety. To strengthen alignment with global AT standards, this review integrates WHO's GATE initiative[8], the International Classification of Functioning, Disability and Health (ICF) domains[9], and the 5P Model.[8] Together, these frameworks provide a rigorous foundation for evaluating the legitimacy of smartwatches as assistive products and situating them within global AT policy and service ecosystems.

The WHO GATE initiative emphasizes four pillars - Policy, Products, Provision, and Personnelto ensure equitable access to essential assistive products worldwide. Although smartwatches are not yet formally classified as AT by WHO, their widespread availability, affordability, and adaptability strongly resonate with GATE's goals of reducing barriers and expanding access to functional support technologies. GATE advocates for user-centered, scalable, and context-appropriate solutions; smartwatches align with these priorities by offering customizable features, ease of distribution through commercial markets, and multifunctional capabilities that can substitute or complement traditional AT. As LMICs face growing needs with limited AT infrastructure, smartwatches serve as practical, scalable tools that address gaps in provision and reduce dependency on specialized AT suppliers.[8]

From an ICF perspective, smartwatch functionalities map directly onto multiple domains of functioning. They support body functions by assisting with memory, attention, and physiological monitoring; activities, through features that aid navigation, communication, self-care, and time management; and participation, by enhancing social connectedness, safety, and community engagement. Importantly, in the ICF framework, assistive products are conceptualized as environmental factors that act as facilitators. Smartwatches fit this function by reducing barriers in everyday environments such as prompting medication adherence, alerting users to hazards, or improving orientation during mobility tasks. Their ability to integrate with digital ecosystems further elevates them as adaptive environmental facilitators, capable of supporting a wide range of user needs.[9]

The 5P Model further illuminates how smartwatches can be positioned within a sustainable AT system.[8]

People: Smartwatches benefit diverse users including individuals with cognitive impairment, sensory limitations, mobility challenges, or chronic health conditions by providing discreet, non-stigmatizing support.

Products: As mainstream wearables with AT-like features, they exemplify the shift toward inclusive design and the convergence of consumer technology with assistive functionality.

Personnel: Smartwatches can be recommended and supported not only by rehabilitation professionals, but also by primary healthcare providers, caregivers, and even the users themselves, reducing the burden on scarce AT specialists in LMICs.

Provision: Their mass-market production, retail availability, and compatibility with mobile health ecosystems overcome traditional AT barriers related to distribution, maintenance, and cost.

Policy: Including smartwatches in national AT lists or digital health strategies would expand access to functional support technologies and align with WHO priorities for universal health coverage (UHC) and inclusive health systems.

By grounding smartwatch use in WHO GATE, ICF, and the 5P Model, this review analyzes the key technological features that enable their assistive potential, the structural barriers that limit broad adoption, and the policy and service innovations needed to mainstream them into formal AT systems. Ultimately, we argue for a shift in perspective: smartwatches should not be viewed merely as commercial wearables, but as valuable assistive tools that advance inclusion, independence, and health equity for people with functional limitations worldwide.

DISCUSSION

Interpretation of Evidence

Smartwatches play several roles: they support cognition, help diagnose mental illness, aid communication, track physical activities, enhance sensory input, promote environmental awareness, and ensure personal security. In this section, we describe the main functions of AT smartwatch applications, list their features, outline existing barriers to optimum use, and suggest steps to address them.

1. Support for Cognitive and Neurological Disorders

Smartwatches are increasingly being used to assist cognition and mental health care for users with neurological conditions like Dementia (eg, Alzheimer's disease, Frontotemporal dementia), Parkinson's disease, and epilepsy. People with Alzheimer's can be assisted with task completion by offering visual or haptic cueing. These cues alleviate anxiety associated with forgetfulness. An added feature is GPS-based geofencing, which alerts caregivers when the user moves beyond a designated safe zone, enhancing safety and monitoring for individuals with these impairments.

A recently added advanced feature in smartwatches is behavior tracking and recognition. Smartwatches with gyroscopes, accelerometers, and microphones can monitor and categorize abnormal or repetitive movements. One system uses a 3-axis accelerometer to track problematic behaviors in children with developmental disorders. This system helps with behavioral assessment and communication enhancement.[10] The general workflow has several steps: sensors collect sound and movement data, features are extracted for behavior classification, and AI model-based classifiers identify alerts linked to detected behaviors. The device's gesture recognition software uses machine learning algorithms such as Support Vector Machines (SVMs)[11] and Bayesian Networks.[12] These algorithms identify user gestures and trigger the right context-aware response.

There have been other research efforts to develop wearable systems for individuals with physical, cognitive, or developmental impairments impacting self-care. These systems record an individual's hygiene over time. They monitor behaviors such as tooth brushing, hand washing, and bathing, helping caregivers and healthcare professionals understand routines, detect neglect, and provide timely support.[13] For conditions like Parkinson's disease or epilepsy, a wearable device, such as a smartwatch, can provide an actionable way to detect tremors, dyskinesias, or seizure activity and share data with caregivers or health professionals. An introduction to mobile-assisted living (MAL) systems has also shown that these technologies facilitate health professionals' real-time assessment of activity, vitality, and fall risk based on changes in health status.

These smartwatches can act as guardians of safety. With geofencing, they gently guide someone home if they wander, using vibrations or cues. The watch can also alert loved ones in the background. In moments of confusion or anxiety, the smartwatch can offer comfort through mood check-ins, soothing messages, or by playing a favorite song or showing a favorite photo. This helps reconnect the user to their identity and memories.

For those with progressive dysarthria, ALS, or other neurodegenerative speech and language disorders, voice banking is becoming a valuable assistive strategy. Personalized voice recordings are stored on smartwatches or in the cloud. These allow users to communicate through speech-generating devices using their own voice. This approach supports communication and helps maintain personal identity and emotional connection, even after natural speech is lost.

To truly support individuals living with cognitive decline, smartwatches of the future should go beyond basic functionality and become caring, intuitive companions. Imagine a device that understands where someone is, what they're doing, and gently nudges them when it's time to take medication, eat a meal, or head to an appointment, not with cold reminders, but with familiar voices and friendly photo-prompts that feel personal and reassuring.

Despite their potential, several barriers hinder the adoption of advanced smartwatches to support individuals with cognitive and neurological disorders. Technical limitations such as the lack of battery-efficient, real-time AI for context awareness and emotion recognition remain significant challenges. Additionally, for patients with cognitive or behavioral conditions, a key practical concern is that smartwatches can be easily removed or discarded by the user, limiting their effectiveness for continuous monitoring and intervention. Privacyconcerns about sensitive data, such as location and behavior, also raise ethical issues. Cost and accessibility can limit availability, especially for families with financial constraints.

2. Communication and Accessibility

Smartwatches have the potential to enhance communication, accessibility, and community inclusion for individuals with impairments through features like accessible navigation, real-time auditory or tactile cues, screen readers, Augmentative and Alternative Communication (AAC) tools, and visual schedules. Smartwatches offer non-verbal communication features using gesture recognition, these features are particularly advantageous for users with speech disorders or developmental disabilities, such as autism and apraxia, as well as those with multiple disabilities. These features allow individuals with complex communication needs to communicate more effectively with caregivers, peers, and their surroundings. [10,14] Integration with public transport, local services, and multilingual support can further promote their independence.

However, several barriers still limit their usability,such as small screens, limited customization, unreliable gesture recognition, high costs, and the need for stable connectivity. Privacy concerns and a lack of user training also pose significant challenges to the adoption of inclusive assistive technologies.

3. Physical Health Monitoring

Smartwatches are increasingly acknowledged as valuable assistive technologies for individuals with chronic illnesses, physical impairment, and aging-related health issues. Smartwatches provide non-invasive, continuous monitoring of vital signs and related metrics, such as heart rate, ambulatory blood pressure[15], blood oxygen saturation (SpO2), and glucose levels[16], enabling preventive care and health feedback to support timely, adequate medical responses. For example, elevated resting heart rate, as well as poor heart rate recovery, has been linked to a higher risk for mortality and cardiovascular events. Heart rate variability (HRV) is another core measurement provided by wearables and is important to an individual's physical health, emotional state, and cognitive well-being. Depressed HRV has been shown to be associated with cardiovascular disease, diabetes, anxiety, depression, and schizophrenia. Smartwatches can measure HRV using photoplethysmography (PPG) or pulse rate variability (PRV) techniques.[17] Smartwatches are widely available, equipped with integrated biosensors, accelerometers, and gyroscopes that monitor vital signs and classify their severity.[15] Smartwatches also support continuous glucose monitoring (CGM) and may help manage diabetes.[15,18] CGM smartwatches limit finger sticks, provide real-time notifications of glucose level changes, enhance behavior change, and lower patients' care costs.

In addition to measuring physical health, smartwatches can help assess various facets of mental health. Smartwatches can measure the stress response in the wearer by continuous health monitoring, for example, HRV during sessions (e.g., a work activity) to classify these into stress, anxiety, or even depression. Some smartwatches are built to allow straightforward cognitive tests that assess memory, attention, and executive function, some of the mental skills that may indicate cognitive decline.

For elderly users, smartwatches can assist in monitoring and tracking bone health by tracking physical activity and sedentary behavior. Researchers have established the correlation between high-impact activity and improved bone mineral density using data from embedded motion sensors. At the same time, prolonged sedentary behavior represents a threat to bone density, especially for older women. [19,20]

Incorporating AI-driven data analytics could provide personalized alerts for trends such as an elevated resting heart rate or missed medications. Features supporting wellness,like posture reminders, stress management prompts, sleep coaching, and activity form guidance, can promote healthier routines. Integration with electronic health records and caregiver dashboards would enable seamless remote monitoring and early intervention. With longer battery life, user-friendly design, and real-time feedback, these additions could transform smartwatches into powerful, proactive health management tools.

4. Sensory Support and Environmental Awareness

Smartwatches have the potential to make everyday life easier and safer for people with sensory impairments. A smartwatch-based assistive tool is Sound Watch, a device designed for users who are either deaf or hard of hearing, that provides real-time visual or vibration alerts on the user's wrist when it detects essential environmental sounds (e.g., doorbells, alarms, sirens, crying, etc). It utilizes on-device machine learning sound classification algorithms to monitor spatial audio or ambient sound, and maximize situational awareness.[21]

Smartwatches like the Dot Watch, designed for blind individuals, deliver notifications, such as messages and time updates, directly via a Braille tactile display on the watch face. In addition, some smartwatches support alternative notification methods, including voice alerts via built-in speakers, vibration cues, and text-to-speech outputs. These multimodal features ensure that blind and visually impaired users, as well as those with reading difficulties, can access information in real time. [22] Newer features use visual recognition algorithms to enhance environmental awareness. For instance, a smartwatch could recognize a wet floor sign or a product logo, and notify the user with vibration feedback when a hazard is detected. This is useful for the blind or for a cognitively impaired user to navigate unknown or dangerous environments. [23]

Advances in the Internet of Things (IoT) and smart sensor technology have significantly expanded the capabilities of smartwatches. Beyond detecting environmental hazards, these devices can now accurately recognize a wide range of activities from common movements like walking and running to more specialized gestures, such as those performed while cooking. While traditional generative models, such as Hidden Markov Models (HMMs)**,** have limitations for real-time use due to computational demands, more efficient classifiers will enable broader application in real-life assistive settings.

To better support individuals with sensory impairments, smartwatches can be enhanced to improve environmental awareness through real-time, multi-sensory feedback, such as converting essential sounds like alarms, doorbells, sirens, or a crying infant into vibrations or visual alerts, thereby promoting greater safety and independence for users with hearing loss. In the future, they could offer more targeted vibrations, sounds, or visual cues to help users stay aware of their surroundings, such as alerting them to nearby obstacles or changes in noise or air quality. With features like AI-powered object detection and better connections to smart home or public systems, these devices could provide real-time support. Making them more intuitive and user-friendly will be the key to helping more people live independently and confidently.

Though smartwatches can significantly help people with sensory impairments, some barriers remain. Alerts may not work reliably in noisy or dark settings, and features like braille or tactile feedback aren't available on most devices. Small screens, high costs, and complex setups can make them hard to use. Many users may struggle to benefit from these tools without proper training or support.

5. Emergency Preparedness and Safety

Personal safety and emergency preparedness are also a part of assistive smartwatch applications. For example, GPS monitoring, geofencing alerts, and one-touch emergency buttons can help protect vulnerable users, such as children with complex communication needs and elderly users with dementia, from wandering and injuring themselves.12 Caregivers have access to real-time location reports and alerts when users move outside a secure zone, which can enhance peace of mind and promote independence in the user.5 Panic buttons with customizable alert messages, silent distress signals, or gesture-based SOS triggers offer discreet ways to request help. A study has proposed a smartwatch-based telecare service for location tracking, activity analysis, and fall detection throughout the day, and for responding with SOS alerts to emergency services.[24]

Smartwatches' emergency preparedness and safety are enhanced with innovations that enable rapid response, early detection, and real-time communication. Features like advanced fall detection, automatic crash or impact alerts, and vital sign monitoring for anomalies (e.g., sudden drops in heart rate or oxygen levels) can trigger immediate emergency notifications. Integrating local emergency services and geolocation sharing can streamline rescue efforts, especially for vulnerable users such as the elderly or persons with impairments. Smartwatches can also be equipped to detect environmental hazards such as extreme temperatures, poor air quality, or disruptive noise, providing users with timely warnings. In disaster scenarios, offline communication using Bluetooth mesh networks or low-power emergency broadcasting could help users stay connected without cellular service. These safety-centered innovations would make smartwatches wellness tools and vital companions for real-time emergency readiness and personal security.

While these features hold great promise, they also come with practical limitations. Fall detection and SOS alerts may produce false positives or miss real incidents, and their accuracy often depends on a stable internet connection. Continuous tracking and alert functions can also drain the battery quickly. Additionally, many advanced features are costly, limiting accessibility, and not all emergency services are equipped to respond to smartwatch alerts. Users may forget to wear or charge the device, and both users and caregivers may struggle to operate the technology without proper training and setup.

Figure 1: Domain-Based Categorization of Smartwatch Applications in Assistive and Health Monitoring

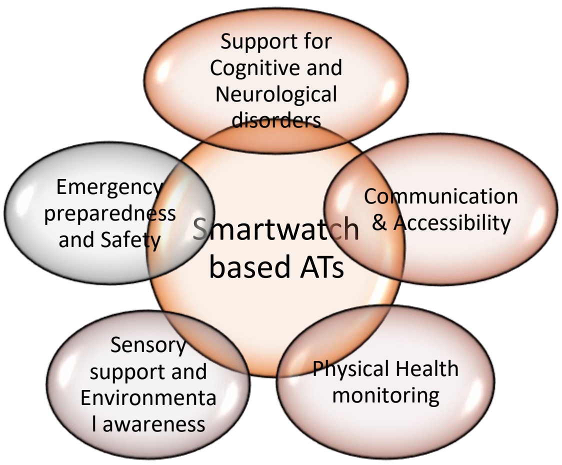

Table 1: Smartwatch Applications across Functional Domains in Assistive and Health Monitoring

Domain	Target Group / Condition	Technology / Device	Function / Use	REFERENCE
Cognition	Children / individuals with behavioral disorders	3-axis accelerometer, gyroscope, microphone sensors	Classifies abnormal behaviors and recognizes activity patterns.	[15]
Cognition	Individuals with MCI or early dementia	SOS button, sensor integration	Provides emergency support, tracks pulse, movement, and location.	[15]
Cognition	Children with CCN	Safe zone GPS tracking system	Sends real-time alerts when the user leaves predefined safe areas.	[15]
Cognition	Individuals with dementia	Wearable sensing framework	Monitors personal hygiene behaviors.	[15]
Cognition	General cognitive assessment users	Sensor-integrated cognitive tests	Conducts remote assessments of memory, attention, and executive function.	
Communication	Deaf/hearing impaired	Deep-CNN-based sound classifiers	detect and identify specific sounds, providing users with alerts through customizable visual and vibrational feedback on their watch (sounds such as doorbells, sirens)	[21]
Communication	Individuals with CCN, dementia, ASD, motor/cognitive disabilities	Telecare systems	Provides SOS alerts, activity monitoring, reminders, and GPS tracking.	[23]
Communication	Users with communication or mental health conditions (e.g., ADHD)	Gesture recognition (Bayesian Networks / SVM)	Provides tactile (vibration) feedback upon task completion.	[24]
Physical health monitoring	Persons with chronic illness, general users	PPG (Photoplethysmography), Oscillometric-based techniques	Measures and monitors blood pressure and heart rate during activity and rest.	[17]
Physical health monitoring	General patient populations	Accelerometers and gyroscopes	Detects body movements and supports mobility related monitoring like fall detection	[15]
Physical health monitoring	Older adults	Research-grade accelerometers	Assesses bone health in relation to physical activity.	[20]
Physical health monitoring	Fitness tracking	Multi-sensor modules with algorithms	Tracks steps, calories, distance, and supports GPS-based activity logging.	[16]
Physical health monitoring	General users	ABPM, subcutaneous glucose monitoring	Enables long-term blood pressure and glucose level monitoring.	[25]
Sensory support and evironmental awareness	Blind individuals	Dot Watch	Displays time and messages in braille through a tactile interface.	[22]

Sensory support and evironmental awareness	Visually impaired / blind	Logo/symbol recognition module	Alerts to wet floor signs via vibration; identifies symbols/products during shopping.	[23]
Sensory support and evironmental awareness	Blind and illiterate individuals	Camera-based text scanner	Converts scanned text into audio output.	[23]
Emergency preparedness and safety	Individuals with dementia, CCN, ADHD	GPS/emergency call buttons, motion sensors	Sends emergency alerts and user location to caregivers or contacts.	[15]
Emergency preparedness and safety	General users (emergency CPR)	Smartwatch with accelerometer	Offers real-time CPR feedback (depth, frequency, and timing).	[15]
Emergency preparedness and safety	SpO2 monitoring	Built-in PPG-based SpO_2 sensor	Monitors blood oxygen saturation levels for respiratory health.	[26]

Barriers

Despite significant potential as AT, smartwatches face limitations that limit their overall effectiveness, especially for users with functional impairments. Battery life can be an important limitation factor. The consequences of short device battery life can lead to usability issues with high data frequency or continuous monitoring -the battery does not allow enough high-capacity power to run a device continuously. In addition, variability in sensor quality across devices affects the reliability and accuracy of health-related measures such as heart rate, blood pressure, and glucose levels, thereby substantially reducing their clinical potential.

Affordability, accessibility, and usability challenges vary for people with disabilities. High device costs, subscription fees, limited insurance coverage, and digital literacy disparities create barriers. Families supporting individuals with cognitive or behavioral conditions who may require continuous monitoring may face repeated replacement costs, especially if users remove or damage devices. Subscription-based advanced health features add recurring expenses not typically covered by insurance or national AT programs. Users with visual, cognitive, or motor impairments may encounter interface and usability limitations requiring inclusive design modifications. Small touchscreens hinder navigation for individuals with motor impairments or low vision. Limited haptic or auditory customization restricts use by deafblind or multi-sensory impaired users, and complex app ecosystems may overwhelm people with dementia, autism, or intellectual disabilities. Some users remove devices due to sensory sensitivities, behavioral dysregulation, or discomfort. Smartwatches need to be made more affordable so that people who genuinely need them, especially those with impairments, can access and benefit from them as everyday assistive tools, enabling greater independence and dignity.

Data privacy, cybersecurity, and ethics are central concerns for wearable AT. Continuous biometric monitoring, geolocation tracking, and cloud-based storage increase the risk of data breaches, consent challenges, and algorithmic bias. Ethical integration requires secure encryption, transparent data governance, and safeguards for vulnerable users. Users' health, location, and behaviors are sensitive data, and their collection, storage, and transmission may leave users vulnerable to breaches. Encryption protocols must be a strong aspect of users' geolocation health and safety data, and accountability to user trust is paramount for encryption and Privacy Protection Laws.

A major aspiration in wearable health technology is the development of smartwatches capable of noninvasive blood glucose monitoring. For individuals living with diabetes, the daily burden of finger pricks or sensor insertions can significantly affect quality of life. In recent years, several consumer devices, including smartwatches and rings, have emerged that claim to estimate blood sugar levels using optical or bioimpedance sensors. However, none of these solutions has received FDA approval, largely due to concerns regarding clinical accuracy and reliability. Despite these limitations, the continued pursuit of a noninvasive, painless method for glucose monitoring reflects an urgent and deeply felt need. If achieved, it could transform diabetes management and bring meaningful relief to millions of users worldwide. [27]

Addressing socio-economic and digital inclusion factors is essential. Individuals in low-resource settings may face limited internet connectivity, low device affordability, and insufficient technical support. Digital connectivity barriers such as poor or inconsistent internet coverage limit the delivery of real-time emergency alerts, remote monitoring, and AI-driven services. Cloud-dependent applications may fail offline. Global smartwatch markets prioritize wealthy consumers; assistive features may not be available in lower-cost models, and households with low income may prioritize essential expenditures over digital AT. Caregivers in low-resource settings may lack digital literacy to configure complex interfaces, and local health workers may not be trained to interpret smartwatch data. Women, rural residents, and persons with multiple disabilities are often disproportionately affected by poor connectivity, lower access to devices, and reduced financial independence. Integrating digital inclusion strategies such as subsidies, community digital support, simplified interfaces, offline functionality, and localized languages can help smartwatches reach marginalized populations more effectively. Overcoming these limitations in functionality and usability is crucial for increasing the reliability, accessibility, and sustained uptake of smartwatch-based AT. Future development should focus on accessibility, reliability, security, and longer-lasting batteries to enable wearable assistive technologies to support vulnerable populations meaningfully.

Future Avenues in Assistive Technology for Smartwatches

The future of smartwatches as an AT will depend on greater integration with artificial intelligence (AI), further miniaturization of sensors, and broader clinical validation of solutions tailored to the needs of users with disabilities and chronic conditions. AI and machine learning models could be used to inform predictive health events, generate conditional alerts tailored to an individual user's needs, and provide personalized, bespoke interventions.

Integrating smart home systems and the Internet of Things (IoT) will take smartwatch capabilities and functionalities beyond the wrist, enabling users to control home appliances, lighting, security, and environmental sensors, thereby promoting independence for individuals with physical or cognitive limitations. Expanding telehealth platforms that use smartwatch data will enable people to remotely capture and manage chronic conditions, making healthcare more accessible and timely.

Finally, smartwatches are ultimately the intersection between consumer electronics and AT. When smartwatch priorities focus on user needs, data security, and inclusive design, watches can evolve from a useful gadget into an essential tool for promoting safety, independence, and quality of life for individuals with disabilities.[15]

To fully realize this potential, ongoing research must emphasize rigorous clinical trials and validation studies to demonstrate the effectiveness, safety, and reliability of smartwatch-based assistive solutions. User-centered design principles are essential to ensure interfaces are intuitive and accessible for users with various disabilities. As technology advances, smartwatches are expected to incorporate more sophisticated sensors and leverage AI-driven insights, becoming integral tools for proactive health management, autonomy, and improved quality of life.

Smartwatches should be formally recognized and incorporated into national disability and AT policy. To realize their potential, policymakers should provide regulatory guidance, demonstrate clinical validity, enable subsidization, and raise public awareness. These steps will help ensure affordability and accessibility, and build trust in capital to help all people with impairments recognize smartwatches as a fundamental tool to enhance their autonomy, health equality, and social participation, especially in marginalized communities.

Authors Contribution

MS- Writing–original draft and data curation; SR Conceptualization; SRK,VYV, SS ,SB - Review and editing.

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Conflict of Interest

Nil

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Declaration of Generative AI and AI Assisted Technologies in the Writing Process

The authors haven’t used any generative AI/AI assisted technologies in the writing process.

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