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Component 1: Written Report

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Introduction

The use of smartwatch in UK health and social care represents a change to ongoing, data-driven, home-based support. By facilitating real-time monitoring, early intervention, and more effective utilisation of worker capacity, these devices improve service delivery. Families are reassured and have a better understanding of their well-being, while patients feel safer, more independent, and more involved in their treatment. Workflows that are more proactive and responsive are advantageous in community settings, including private residences and assisted living facilities. Co-production is strengthened by shared data, facilitating cooperative decision-making among patients, families, and professionals. By encouraging prevention and generating actionable data for community health planning, smartwatches support population-level public health objectives.

Impact on work force

A growing area of interest with some pertinent findings from recent studies is the use of smartwatches in health and social care settings, particularly with reference to staff well-being and stress monitoring. Wearable technology and other digital health interventions have been investigated as ways to help healthcare workers, who frequently deal with demanding jobs and long-term stress, reduce their stress. According to one study protocol, Fitcor is an app-based intervention that combines digital coaching with physiological monitoring, such as heart rates variability, sleep quality, and daily movement recorded via sophisticated sensors like wearables, to lower stress on healthcare workers, including nurses and administrative staff. This strategy seeks to remove obstacles associated with time limitations and shift work, which have historically restricted access to stress-reduction programs in healthcare settings (Baumann, H. et al. 2023). Smartwatches have been used to track more general physiological reactions, like heart rate and stress levels, which can give objective information on stress levels and health. During the COVID-19 vaccine, smartwatches identified physiological changes that participants did not always report, demonstrating the wearables' potential sensitivity in detecting minute health-related changes (Guan, G. et al. 2022).

Improving staff safety

By offering physiological data that could help well-being interventions, smartwatches in health and social care settings have the potential to lessen employee fatigue. Regarding occupational health and employee well-being, wearable technology and smartwatch have been investigated in health and social care contexts. Wearable technology, such as continuous physiological monitoring devices like smartwatches, have the potential to

improve staff safety among healthcare workers, according to evidence from a scoping review. These technologies have the potential to improve organisational resilience and workflow efficiency. The study does point out that the evidence is still dispersed, with little economic data and inconsistent results across studies (Virgillito, D., Catalfo, P. and Ledda, C. 2025).

Homebase (Remote Monitoring)

Health and social care settings such as cardiac rehabilitation, post-COVID care, and clinical event monitoring in hospital settings—all of which are pertinent to virtual wards, community care, long-COVID clinics, and mental health services in the UK—smartwatches have been investigated as tools for remote monitoring. A smartwatch-assisted home-based cardiac rehabilitation (HBCR) program enhanced exercise regimen adherence and clinical outcomes like cardiopulmonary function, anxiety, depression and quality of life in patients with coronary heart disease. According to a randomised controlled trial. Real-time feedback, remote supervision, and smartwatch-based physical activity monitoring, were all part of the intervention (Zhang, S. et al. 2025).

Impact on service delivery

Changes in service delivery

The practice of staff evaluating overnight smartwatches dashboards at the start of shifts rather than waiting for patient reports is consistent with the growing use of smartwatch in healthcare for data accessibility and ongoing patient monitoring. It has been demonstrated that smartwatch can continuously and remotely gather vital indicators including blood pressure, heart rate, and oximetry, giving medical professionals quick access to patient data via digital platforms. One study suggested a digital approach that allows clinical teams to monitor patients without being physically present at the bedside by continuously and remotely displaying smartwatch-collected vital signs. However, it found difficulties on urgent event monitoring because of synchronisation delays (Bin, K.J. et al. 2022).

More care delivered at home

In the UK, patient risk and clinical necessity seem to have a greater impact on home visit prioritisation than following set schedules. Primary care in the UK was significantly reorganised during the COVID-19 pandemic, with a considerable increase in telephone and electronic/video consultations and a notable decrease in in-person consultations and home

visits. Alongside this change, there was an emphasis on patients with greater complexity, such as those who were frail or had poly pharmacy, suggesting that care, including home visits, was focused on patient risk factors rather than regular scheduling (Joy, M. et al. 2020).

New digital workflows for clinicians

Numerous research outlining systems that incorporate continuous patient data into clinical processes help clinicians modifying care plans over the day based on real-time data patterns. One strategy uses dynamic, closed-loop systems that gather behavioural and physiological data from wearable technology, such as activity levels and heart rate variability, and input it into hospital dashboards. These systems generate automated suggestions for physicians to alter treatment plans, including pharmaceutical and lifestyle treatments, by using lightweight machine learning models to identify anomalies and patterns. Following professional approval, these recommendations are shared with patients, resulting in a two-way feedback loop that facilitates continuous care modifications throughout the day (Sivakumar, S., SivakumarPT, S. and Jambulingam, U. 2025).

More proactive social care

Providing continuous physiological data that can notify healthcare providers of worsening and enable prompt interventions, the incorporation of smartwatch in remote triage has also enabled operational modifications. By reducing needless hospital admissions and freeing up professionals to concentrate on patients in need of more sophisticated care, this lessens the strain on the healthcare system. In this situation, the usage of smartwatch facilitates the transition to more patient-centred and technologically enabled treatment pathways, which can be especially helpful in managing vulnerable groups like expectant mothers during a pandemic. (Bircher, C. et al. 2022).

Better evaluation of wellbeing interventions

By permitting continuous and patient-held monitoring of vital indicators like heart rate and steps count prior to hospital presentation, smartwatches have impacted the daily service shift in identifying early clinical deterioration in the UK. The viability of using data from smart devices to identify notable changes in heart rate and mobility in the days preceding an acute illness presentation was shown in an international multi-centre trial involving UK hospitals. Patient disposition was linked to these physiological changes, indicating that wristwatch data may aid in therapeutic decision-making and possibly forecast decline prior to hospital admission (Den Duijn, J.G.A. et al. 2025).

Impact on patients

Greater sense of safety and reassurance

The benefit of continuous, non-invasive vital sign monitoring, which is becoming more widely acknowledged in postoperative and general patient care, is one aspect of patients' perceptions and experiences using smartwatches in healthcare settings. During their hospital stay, postoperative patients who used well-known fitness trackers like, the Apple Watch 7, Garmin Fenix 6 Pro, and Withing's Scan Watch reported positive experiences with continuous monitoring. There was also high agreement regarding data sharing for research purposes and overall user experience, indicating acceptance of continuous vital sign monitoring through these devices (Helmer, P. et al. 2025).

Improved sense of control and involvement

By offering real-time feedback and promoting self-management, wearable activity trackers and smartwatches have an impact on patients' sense of control over their medical issues. More than changes in nutrition or sleep, users frequently say that these gadgets help them become more physically active, which they view as a good behaviour change. Patients appear to feel more involved and in control when they obtain timely information about their health practices, as seen by the slightly higher value placed on wearable quick input compared to long-term monitoring (Maher, C. et al. 2017).

Reduced need for hospital or GP visits

Smartwatches have the potential to Patients' participation in health monitoring could potentially minimise travel expenses in the UK by indirectly reducing the need for hospital or general practitioner (GP) visits (Midaglia, L. et al. 2019). By enabling continuous, remote monitoring that seamlessly integrates with daily activities, these technologies may help reduce disruptions to daily life in healthcare settings (Hamy, V. et al. 2023).

Mixed feelings about data accuracy and trust

Concerns regarding data accuracy and privacy have a big influence on patient opinions. Privacy problems are raised by the collection, storing, and sharing of private health data, which was formerly only available to healthcare professionals but is now widely distributed across many platforms, including cloud services (Lehto, Miika and Lehto, Martti 2017).

More active involvement in care

Smartwatches can increase patients' sense of empowerment and control over their health, by providing real-time data and ongoing health monitoring. This has an impact on how

patients view and interact with their care. Users appreciate being able to measure vital signs, physical activity, and other physiological indicators since it promotes proactive health management and self-monitoring behaviours (Ranpreet Kaur et al. 2025).

Mixed feelings about digital care

By measuring a variety of health indicators and identifying illnesses including atrial fibrillation and heart dysfunction, smartwatches have shown promise in healthcare monitoring.

However, some patients may find it difficult to understand the notifications these gadgets create, which could add to their digital load. This burden results from the requirement that patients handle the data provided by the smartwatch and comprehend the importance of warnings, which may not always be simple or clinically proven. Patients may not completely understand the clinical significance of the warnings or how to react appropriately, which might lead to doubt or fear (Masoumian Hosseini, M. et al. 2023).

Effects on the community

Increased reassurance

By providing continuous monitoring of vital signs, activity data, wearable technology, such as smartwatches, has been highlighted as a tool that helps patients live more safely at home.

To remotely evaluate patient safety and health status, these devices frequently monitor heart rates, oxygen saturation, movement, falls, sleep, and physical activity. Heart rate, oxygen saturation, respiratory rate, and physical activity, are commonly monitored by smartwatches and fitness trackers with sensors including electrocardiography and photoplethysmography. This data can be used to guide care decisions and actions. (Kukreti, S. et al. 2025).

Patients, particularly older persons, those with chronic illnesses, and those living alone, can feel confident that any decline in their health state will be identified early thanks to smartwatch-based continuous monitoring. This is reinforced by research demonstrating the feasibility and utility of smartwatch-based monitoring in various patients' populations.

Continuous home-based monitoring with smartwatches and smartphone apps enables precise and customised surveillance of motor fluctuations and symptom variations for those with long-term diseases such severe Parkinson's disease. This method makes it possible to identify unique patterns of symptom changes associated with drug cycles, which may enable prompt clinical interventions and treatment modifications, potentially improving patient

outcomes and reassuring patients that their condition is being closely monitored (Fay-Karmon, T. et al. 2024).

The use of wearables technologies, such as smartwatches, within virtual wards is consistent with research showing that patients who are followed remotely typically have low clinical acuity and comparatively low hospital readmission rates. The continuous data from wearables can improve decision-making in community settings and supplement clinical examinations, notwithstanding the poor predictive accuracy of early warning ratings such as NEWS2. By efficiently managing patients at home and avoiding needless hospital stay. (Scott, L.J. et al. 2026).

Increased reassurance

It has been demonstrated that smartwatches offer useful remote monitoring features that can help families feel more secure about the health of their loved ones. At rest and throughout recovery, these devices may monitor vital indicators like heart rate quite accurately; but, during peak exertion, accuracy may decline. Even in cases when people do not report symptoms, minor health changes, such as reactions to COVID-19 vaccination, have been identified by ongoing monitoring of physiological responses, including heart rate variability.

To assist patient self-management and collaborative care, smartwatches have been included into healthcare increasingly. This is in line with objectives like promoting patient participation, collaborative goal setting, and more individualised interventions. One example of an inclusive strategy involving patients, carers, and healthcare professionals is the co-creation of digital materials to facilitate wristwatch use in chronic illnesses like COPD.

Through a variety of features, such as promoting physical activity, monitoring stress, tracking sleep, assisting with weight management, and spotting early health decline, smartwatches promote public health objectives. Smartwatches can encourage users to enhance their levels of physical activity by providing objective statistics like step counts, daily calories burnt, and physical activity metrics. Evidence, however, indicates that while some users participate in competitions and exercise monitoring capabilities, many are not aware of these functions.

Conclusion

The use of smartwatch in UK health and social care has improved efficiency and early intervention by shifting services towards ongoing, data-driven, home-based support. Digital monitoring reduces regular visits and frees up time for complex treatments by enabling alert-

led decision-making for the staff. Although some encounter digital obstacles, patients enjoy increased safety, autonomy, and involvement. Shared care is strengthened as families receive comfort and a better understanding of wellbeing. Workflows that are more proactive and responsive benefit service sites, including homes and care facilities. By encouraging prevention and producing population insights, smartwatches serve public health objectives and improve co-production at the community level.

References

- Baumann, H. et al. (2023) “mHealth interventions to reduce stress in healthcare workers (fitcor): study protocol for a randomized controlled trial,” *Current controlled trials in cardiovascular medicine*, 24(1). Available at: <https://doi.org/10.1186/s13063-023-07182-7>. Accessed 15 July 2026
- Bin, K.J. et al. (2022) “Digital Platform to Continuously Monitor Patients Using a Smartwatch: Preliminary Report,” *JMIR formative research*, 6(9), p. e40468. Available at: <https://doi.org/10.2196/40468>. Accessed 15 July 2026
- Bircher, C. et al. (2022) “Remote care and triage of obstetric patients with COVID-19 in the community: operational considerations,” *BMC pregnancy and childbirth*, 22(1). Available at: <https://doi.org/10.1186/s12884-022-04863-0>. Accessed 16 July 2026
- Den Duijn, J.G.A. et al. (2025) “Using Patient-Held Devices to Measure Variations in Resting Heart Rate and Step Count Prior to Presentation with an Acute Illness: International, Multicentre Flash Mob Feasibility Study,” *JMIR cardio*, 9, pp. e76218–e76218. Available at: <https://doi.org/10.2196/76218>. Accessed 16 July 2026
- Fay-Karmon, T. et al. (2024) “Home-based monitoring of persons with advanced Parkinson’s disease using smartwatch-smartphone technology,” *Scientific reports*, 14(1). Available at: <https://doi.org/10.1038/s41598-023-48209-y>. Accessed 16 July 2026
- Guan, G. et al. (2022) “Higher sensitivity monitoring of reactions to COVID-19 vaccination using smartwatches,” *NPJ digital medicine*, 5(1). Available at: <https://doi.org/10.1038/s41746-022-00683-w>. Accessed 15 July 2026
- Hamy, V. et al. (2023) “Patient-centric assessment of rheumatoid arthritis using a smartwatch and bespoke mobile app in a clinical setting,” *Scientific reports*, 13(1). Available at: <https://doi.org/10.1038/s41598-023-45387-7>. Accessed 16 July 2026
- Helmer, P. et al. (2025) “Postoperative use of fitness trackers for continuous monitoring of vital signs: a survey of hospitalized patients,” *Journal of clinical monitoring and computing*, 39(5), pp. 1077–1086. Available at: <https://doi.org/10.1007/s10877-025-01273-3>. Accessed 16 July 2026
- Joy, M. et al. (2020) “Reorganisation of primary care for older adults during COVID-19: a cross-sectional database study in the UK,” *British journal of general practice*, 70(697), pp. e540–e547. Available at: <https://doi.org/10.3399/bjgp20X710933>. Accessed 15 July 2026

Kukreti, S. et al. (2025) "Physiological Sensors Equipped in Wearable Devices for Management of Long COVID Persisting Symptoms: Scoping Review," Journal of medical Internet research, 27(9), p. e69506. Available at: <https://doi.org/10.2196/69506>. Accessed 16 July 2026

Maher, C. et al. (2017) "Users' experiences of wearable activity trackers: a cross-sectional study," BMC public health, 17(1). Available at: <https://doi.org/10.1186/s12889-017-4888-1>. Accessed 16 July 2026

Masoumian Hosseini, M. et al. (2023) "Smartwatches in healthcare medicine: assistance and monitoring; a scoping review," BMC medical informatics and decision making, 23(1). Available at: <https://doi.org/10.1186/s12911-023-02350-w>. Accessed 16 July 2026

Midaglia, L. et al. (2019) "Adherence and Satisfaction of Smartphone- and Smartwatch-Based Remote Active Testing and Passive Monitoring in People with Multiple Sclerosis: Nonrandomized Interventional Feasibility Study," Journal of medical Internet research, 21(8), p. e14863. Available at: <https://doi.org/10.2196/14863>. Accessed 16 July 2026

Scott, L.J. et al. (2026) "Clinical acuity and National Early Warning Scores (NEWS2) of remotely monitored patients on virtual wards: A retrospective cohort study," PloS one, 21(4), p. e0347678. Available at: <https://doi.org/10.1371/journal.pone.0347678>. Accessed 16 July 2026

Sivakumar, S., SivakumarPT, S. and Jambulingam, U. (2025) "Real-Time Feedback Loops from Wearables to Modify Clinical Treatment Plans," 2025 International Conference on Next Generation Computing Systems (ICNGCS). IEEE, pp. 1–6. Available at: <https://doi.org/10.1109/ICNGCS64900.2025.11183203>. Accessed 15 July 2026

Virgillito, D., Catalfo, P. and Ledda, C. (2025) "Wearables in Healthcare Organizations: Implications for Occupational Health, Organizational Performance, and Economic Outcomes," Healthcare (Basel), 13(18), p. 2289. Available at: <https://doi.org/10.3390/healthcare13182289>. Accessed 15 July 2026

Zhang, S. et al. (2025) "Effectiveness of Smartwatch Device on Adherence to Home-Based Cardiac Rehabilitation in Patients with Coronary Heart Disease: Randomized Controlled Trial," JMIR mHealth and uHealth, 13, pp. e70848–e70848. Available at: <https://doi.org/10.2196/70848>. Accessed 16 July 2026

