



Programme: MSc Public Health and Social Care in Practice

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Blog 1: SMS Interventions in Hypertension Management

There is a large problem with hypertension or high blood pressure in this world today. At present, the number of people around the world suffering from hypertension (blood pressure greater than 140/90mmHg) is over 1.13 billion persons (approximately 40 percent of the adult population) (World Health Organization (WHO) 2023). According to WHO, hypertension is reported to be a contributor towards cardiovascular disease, stroke, and failure of kidneys among millions of deaths every year (WHO 2024). Today, hypertension case is burgeoning especially in low- and mid-income countries. Therefore, need for effective innovative approaches to solve the problem. mHealth solutions, specifically SMS prompts (Yuting et al, 2023) are one of the most effective methods.

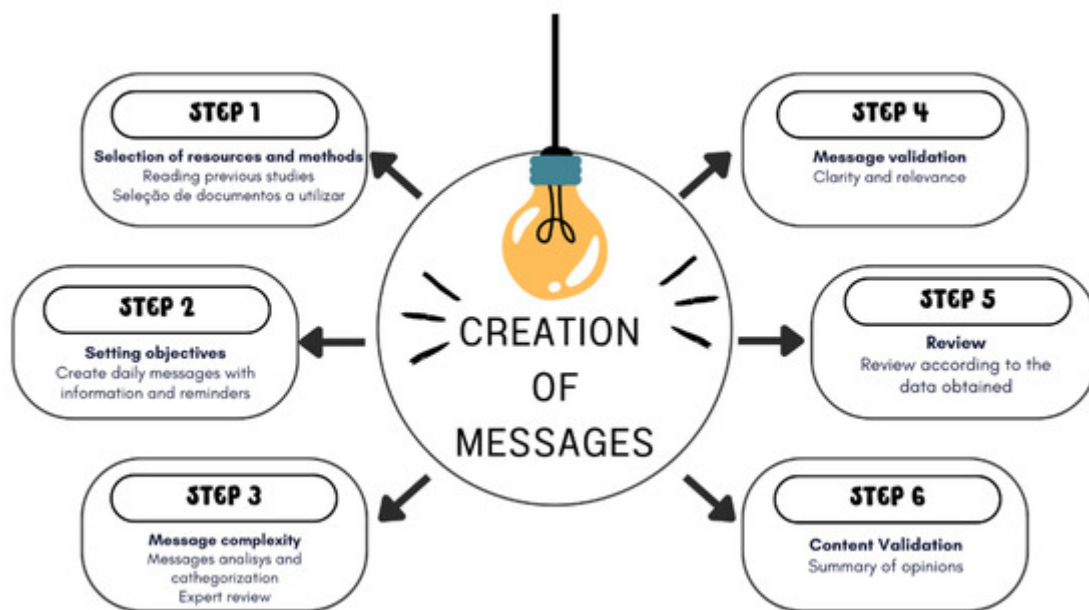


Figure 1: The Creation of Messages for Mobile Health Interventions

Source: (Pereira et al., 2024)

Sending effective SMS messages in mobile health interventions has a very thoughtful process that stipulates the use of appropriate materials, the setting of goals, the depth and granularity of the

messages and content evaluation (Suffoletto, 2024). Consequently, this systematic procedure enhances the performance of SMS reminders and implies positive effect of SMS reminders in medication compliance and lifestyle modification (Materia et al., 2023).

Support is found for mobile health interventions with hypertensive patients. For instance, research has shown that INTERVAL patients who regularly received daily SMS reminders about their medications and adherence had better control of blood pressure than patients not receiving such messages (Redfern et al., 2024). Similarly, another study in Kenya showed that use of SMS reminders also increased compliance with medications in terms of decreased systolic and diastolic blood pressure (Liu et al., 2023). This finding demonstrates how SMS reminders play a key role in improving health outcomes in those areas where there is sparsely available medical care.

Still, SMS-based interventions come with their specific limitations. Engagement remains a big issue; for some patients, reminders sent via SMS may increase short term adherence, but maintaining long term engagement is much harder. In Tanzania, for instance, Ukoaka et al 2024 documented a case where patients participation with the SMS intervention dropped off after a few months. This indicates that motivation without continuous contact or personalization falls back on the effectiveness of reminders over time.

Another limitation is the intervention's accessibility. Even more, a mobile phone is common, not everyone has the required digital literacy or even basic language skills to comprehend the messages (Nouri et al., 2019). In addition, unreliable coverage in many rural regions, as well as the costs associated with purchasing mobile data or SMS services, are likely to limit the use of these interventions.

In conclusion, while mobile health interventions, particularly SMS-based reminders, offer a promising solution to hypertension management, they must be tailored to address the challenges of patient engagement, literacy, and accessibility. By incorporating personalized, interactive tools and ensuring cultural relevance, the impact of mHealth interventions can be significantly enhanced, contributing to better hypertension control worldwide.

Blog 2: HAWE: An Innovative Digital Ecosystem for Holistic Hypertension Management

According to studies conducted by Mills et al. in 2020, around 1.5 billion people globally suffer from Hypertension making it one of the most prominent issue in the world. Hypertension overloads healthcare systems because of its high association with heart diseases, strokes, kidney failures, and even untimely deaths. In fact, Goorani et al. explains in 2024, about half of all adults in America struggle with Hypertension which many times remain undiagnosed or poorly managed. People often refer to Hypertension as a 'silent killer' because, in most of the cases, patients do not find out until it is too late to be treated. As pointed out by Arshad et al., there is a great paucity of Hypertension management programs because lack of accessible healthcare in low income and rural areas makes it difficult to promote healthier lifestyle changes.

HAWE creates a holistic health ecosystem by integrating smart home devices (such as air purifiers and smart thermostats) with environmental sensors to track air quality, noise levels, and temperature, all factors that influence blood pressure. For instance, if the air quality is poor or there's high noise pollution, HAWE prompts the user with health suggestions, like turning on an air purifier or taking a break from noisy surroundings. By combining environmental data with real-time health monitoring through wearables that track blood pressure, heart rate, and stress levels, HAWE offers users a comprehensive approach to managing hypertension.

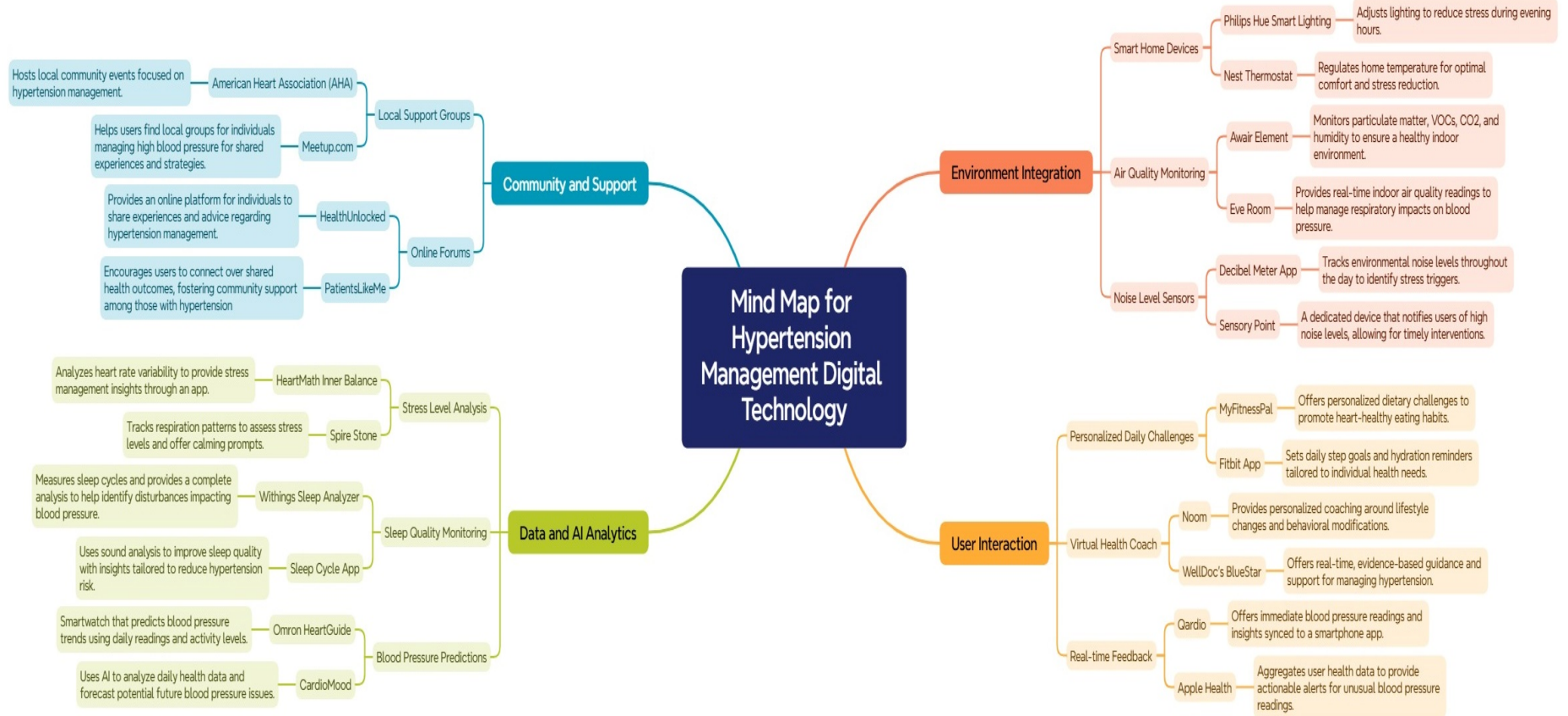
Daily personalized challenges include cutting salt consumption, taking small steps or tracking daily steps, other daily challenges that you can track through Fitbit and MyFitnessPal. Continuous advising and motivation is given by a virtual health coach, guided by health metrics. With AI analytics, HAWE provides real time information regarding a users' sleep, stress and blood pressure trends and such information as to how to respond of based on users' progress and surroundings.

Critical Discussion of the Impact

Advantages: HAWE introduce and innovative take to integrating environmental aspects into individual health data. Unlike most traditional applications, this one combines activities of the user with their surrounding environment such as air pollution and noise pollution which forms a complete intervention to health problems. HAWE's AI prediction and user tailored instruction increases participation giving users motivation to comply with long-term hypertension control.

Disadvantages: Though innovative, HAWE still depends on smart home devices and wearables that may not be accessible in resource-poor environments. Moreover, issues such as a lack of internet connection or imprecise sensors may reduce its usefulness. Also, having a relatively high level of engagement and digital skill is needed, which may be difficult for older people or those who are less familiar with technology.

Addressing Shortfalls: A less expensive option could be created that emphasizes on wearable integration and main features. Local health organizations may partner to offset some of the expenses for underprivileged groups. To enhance participation, basic interfaces and tutorials along with community health education can be added.



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Background

Global burden: Hypertension affects 1.5 billion people globally, with the highest burden in low- and middle-income countries (WHO, 2023; CDC, 2022).

Health impact: It is the leading cause of cardiovascular disease, stroke, and premature death.

Existing interventions:

Non-digital: Community screenings, blood pressure kiosks, nurse-led education programs (He et al., 2020).

Digital: SMS reminders, mobile tracking apps, telehealth consultations (Kumar et al., 2019).

Why HAWÉ is needed: These tools neglect environmental stressors, personalization, and engagement longevity—**HAWÉ** bridges this gap through smart-home integration, real-time wearables, and AI-based personalization.

Behavioural Change Theory

COM-B Model (Michie et al., 2011)

Capability:

Virtual coach improves user knowledge and confidence in BP self-management (Islam et al., 2023).

Tailored health literacy resources and tutorials meet diverse user abilities.

Opportunity:

Environmental sensors identify and reduce stress triggers like poor air quality or high noise (Bhui et al., 2023).

Smart-home feedback removes structural barriers (e.g., poor sleep environment), aiding habit formation.

Motivation:

Gamified tasks, real-time biofeedback, and progress visualizations boost intrinsic motivation (Ratinho & Martins, 2023).

AI-generated success tracking reinforces behavioural momentum and adherence (Tuli et al., 2023).

Critical application: HAWÉ doesn't just react to user choices—it proactively adjusts environmental and behavioural contexts, making it superior to static, one-size-fits-all apps.

Expected Outcomes

- **Improved BP control** through context-aware interventions (environment, sleep, stress).
- **Increased health literacy and self-efficacy**, especially among low-access populations.
- **Higher engagement and adherence** via personalised, gamified support systems.
- **Reduction in health disparities** through digitally inclusive design and localised intervention scaling (Jenkins et al., 2021).
- **Data-driven prediction and prevention** of hypertensive crises through predictive AI modelling (Nguyen et al., 2024).

Conclusion

- **Policy impact:** HAWÉ can inform tech-integrated chronic care guidelines in digital public health frameworks.
- **Educational implications:** Enables community health workers and educators to use real-time feedback for patient education and empowerment.
- **Research innovation:** HAWÉ offers real-world, real-time health-environment-behaviour data, enhancing studies on SDOH and digital equity.
- **Scalability potential:** Culturally adaptable and device-agnostic, HAWÉ represents a scalable model for global digital health equity.

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