
Analysis Shows Personalized Health Coaching, Blood Pressure Monitoring Leads to Control

An Omron and Lark Health Analysis

Hypertension is the leading global risk factor for morbidity and mortality.¹ In 2014, high blood pressure was the primary or a contributing factor in 410,000 American deaths and responsible for \$48.6 billion in medical costs and lost productivity.^{2,3} Only about half of patients with hypertension have it under control,⁴ and high blood pressure is present in 7 in 10 first heart attacks and 8 in 10 first strokes, respectively.⁵ Lifestyle modifications, such as improved medication adherence, nutrition, and physical activity, can significantly lower blood pressure.⁶

In a joint effort, Omron and Lark evaluated how much patients with hypertension could lower blood pressure using an integrated, fully digital solution. Our method led to both statistically and clinically significant changes in blood pressure, providing promise for population level improvement in health outcomes and reduced costs.

PROGRAM DETAILS

Our solution combined home blood pressure monitoring with real-time, focused health and hypertension management coaching. Home blood pressure was measured via Omron's upper arm blood pressure cuff (model BP761N) and coaching was provided by Lark's conver-

sational artificial intelligence (AI) Hypertension Management Program. Lark Hypertension Management program aims to help users lower blood pressure through healthy behavior changes such as monitoring blood pressure, improving nutrition, increasing physical activity, reducing stress, and taking blood pressure medications, all via conversational AI on a user's smartphone. The program included instant feedback when users measured blood pressure with the Omron blood pressure monitor.

Lark and Omron provided their joint digital solution to 159 adults, age 18 or older, with hypertension diagnosed at outpatient clinics. All participants had an initial systolic blood pressure (SBP) of at least 135 mm Hg or diastolic blood pressure (DBP) 85 mm Hg diastolic, and less than 180 mm Hg SBP and 110 mm Hg DBP.

Individuals included in the final analysis had at least three at-home blood pressure readings within the first two days of registering their instance of the Lark Hypertension Management program, and had at least three at-home blood pressure readings within two weeks of the six-month mark from when they enrolled in the Lark Hypertension Management program. The Omron blood pressure monitor took all blood pressure readings, and the integrated Lark pro-

Table 1: Demographic Descriptions

Demographics	
N	76
Gender	21 Male, 27 Female, 28 Undeclared
Age (years)	61.8 (+/- 12.8)

Table 2: Results of Analysis

Results	
Baseline Systolic BP	139.2 (+/- 12.5)
Final Systolic BP	130.8 (+/- 11.9)
Change in Systolic BP	-8.4 (+/- 15.9) (p<.001)
Baseline Diastolic BP	89.0 (+/- 9.4)
Final Diastolic BP	82.6 (+/- 9.3)
Change in Diastolic BP	-6.4 (+/- 7.7) (p<.001)

gram recorded each measurement automatically. Self-reported blood pressure readings were not accepted. A cohort of 76 participants met all the described blood pressure reading criteria for inclusion in the final analysis.

PROGRAM RESULTS

The results of data analysis showed a statistically significant reduction ($p < 0.001$) in both systolic and diastolic blood pressure among the 76 included participants.

This cohort comprised 21 males (27.6%), 27 (35.5%) females, and 28 (36.8%) undeclared. The cohort had an average age of 61.8 years (+/- 12.8). Initial SBP for the cohort was 139.2 (+/- 12.5) and final SBP was 130.8 (+/- 11.9), reflecting a change in SBP of 8.4 (+/- 15.9), and representing a significant reduction ($p < 0.001$). Initial DBP for the cohort was 89.0 (+/- 9.4) and final DBP was 82.6 (+/- 9.3), reflecting a change in DBP of 6.4 (+/- 7.7), also representing a significant decrease ($p < 0.001$). Additionally, 23 participants (30%) successfully moved from a hypertensive diagnosis to full blood pressure control (defined as under 130/80).

Users averaged 141 coaching sessions on nutrition (5 per week), 185 coaching sessions on blood pressure trends (7.3 per week), and 22 Missions completed (deep dives into heart-health and healthy living topics), or roughly 1 per week. Members gave the program a satisfaction score of 9.5/10.

IMPLICATIONS

A decrease of 5 mm Hg in SBP on a population level has been associated with a 34% reduction in incidence of strokes and myocardial infarctions by 21%,⁷ while reducing stroke mortality and coronary heart disease mortality by 14% and 9%, respectively.⁸ Moreover, prior estimates suggest that a blood pressure decrease of 7.2/3.8 could lead to national annual savings of \$18 billion in medical expenses.⁹ In the present intervention, mean decrease in SBP/DBP exceeded these standards at 8.4 SBP and 6.4 DBP. Thus, our analysis suggests that use of the Lark Hypertension Program along with an Omron blood pressure monitor is an easily implemented, infinitely scalable way to drive improved health outcomes and reduced healthcare costs.

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