Background: Ambulatory blood pressure (ABP) is known to provide prognostic information about cardiovascular disease better than office BP. In-pharmacy automated ABP kiosks have also shown to have similar accuracy as manual BP measurements done by healthcare providers. ABP kiosks in retail locations provide an accessible, affordable, convenient and accurate means for patients, who cannot afford home BP devices, to monitor their BP. Other studies have shown mixed results regarding effect of self-monitoring of BP and long term BP control. Not much is known about the correlation of ABP control and self-monitoring of BP with patient engagement and gamification.

Objective: To examine the relationship between ABP and patient engagement with a nationwide ABP kiosk platform.

Methods: De-identified historic data from a nationwide ABP kiosk network (www.higi.com) was analyzed from September 2012 to April 2015. Approximately 9,700 ABP kiosks were deployed within the network during the time period of the study. Approximately 1,928,900 patients created accounts on the engagement platform. Only patients with initial BP measurement in the hypertensive range and those who opted-in to share data for research purposes were included in the study. A total of 158,900 patients met all inclusion criteria for the study. Mean age of the study population was 49 years, with 58% male and 42% female. Almost half the patients were obese (49%). Level of engagement was defined as the number of average monthly logins on the gamification platform (i.e. kiosk, web portal, and mobile app). BP changes were defined as the difference between a patient’s first and last reading on the kiosk network. Patient demographics, level of engagement with the gamification platform and their ABP trends were analyzed.

Results: Figure 1 shows change in Mean Arterial Pressure (MAP) and population by zip code. Patients logging in 5 or more times per month showed an average drop in Systolic BP (SBP) of 17 mmHg and an average drop in Diastolic BP (DBP) of 9 mmHg, with >80% seeing any reduction in their BP, and nearly half reaching BP range below hypertensive (Table 1). There was a statistically significant difference between SBP and DBP change across frequency of engagement (ANOVA p < 0.0001 – Figure 2). Elderly patients showed trend of greater drop in SBP as compared to younger patients (Figure 3), where as females showed greater drop in DBP as compared to males (Figure 4). Patients participating in gamification challenges to win a prize showed greater drop in BP than those that did not participate (Figure 5). Patients utilizing social features of the platform (following friends on the network) also showed greater drop in BP than those that did not engage socially on the platform (Figure 6).

Limitations: Due to lack of control group in this study, the statistical significance observed in this study may not represent causation. We may have measured results of self-motivated patients who on their own or with the help of their provider have achieved better control of the BP. Throughout the course of the study new kiosks were being deployed resulting in some locations where there was not enough time available to measure outcomes for that population, this may have resulted in underestimation of the results. Further studies are needed with control groups to measure the direct effect of gamification on hypertension control.

Conclusion: The results show a statistically significant relationship between frequency of engagement as measured by level of monthly logins on the gamification platform and lowering of systolic blood pressure.

Conflict of Interest: This study was funded by higi SH llc and both authors are employees of the company.

References: