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Virtual patient education for hypertension: The truth about behavioral change

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Abstract

Anti-hypertensive education is an important public health intervention to decrease the mortality and burden of the disease. Using digital technologies for education as a part of preventive measures for hypertension is a cost-effective approach and helps low-income communities and vulnerable populations overcome barriers to healthcare access. The coronavirus disease 19 pandemic further highlighted the need of new health interventions to address health inequalities. Virtual education is helpful to improve awareness, knowledge, and attitude toward hypertension. However, given the complexity of behavioral change, educational approaches do not always provide a change in behavior. Some of the obstacles in online hypertensive education could be time limitations, not being tailored to individual needs and not including the different elements of behavioral models to enhance behavior change. Studies regarding virtual education should be encouraged and involve lifestyle modifications emphasizing the importance of Dietary Approaches to Stop Hypertension diet, salt restriction, and exercise and should be used adjunct to in-person visits for the management of hypertension. Additionally, to stratify patients according to hypertension type (essential or secondary) would be useful to create specific educational materials. Virtual hypertension education is promising to increase awareness regarding risk factors and most importantly motivate patients to be more compliant with management helping to decrease hypertension related complications and hospitalizations.

Key Words: Hypertension; Virtual education; Health promotion; Public health; Patient education; Patient adherence; Dietary approaches to stop hypertension diet

Core Tip: Online anti-hypertensive education can play an important role in preventing and managing hypertension by providing individuals with the knowledge and resources they need to make lifestyle changes. Hypertensive management and education can be difficult in certain populations due to lack of access to healthcare, lack of information, and social determinants of health. Virtual education would promote health in those vulnerable populations.

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TO THE EDITOR

In a recent article titled "Impact of the virtual anti-hypertensive educational campaign towards knowledge, attitude, and practice of hypertension management during the COVID-19 pandemic", Andrianto *et al*[1] emphasized the importance of online education in patients with hypertension[1]. Given the burden of hypertension, we found this article very interesting and promising for health promotion. Hypertension has been described as the "largest epidemic ever known to mankind"[2]. In the United States, nearly half of the adults have hypertension, and only 25% are under control[3]. Being an epidemic globally, it's not surprising that the economic burden of hypertension is enormous. In the United States itself, hypertension costs about \$131 billion each year[4]. From the public health intervention perspective, Andrianto *et al's* study is brilliant as we believe that one of the ways to cut the cost of hypertension is community-based interventions, such as health education and support groups, which can help reduce the cost of hypertension by providing individuals with the information and resources they need to manage their condition effectively[1].

As highlighted by the authors, overall, the coronavirus disease 19 (COVID-19) pandemic has had a significant impact on health disparities and healthcare access[5]. Even in the non-COVID era, patients with low economic status have been disproportionately affected by hypertension. The Prospective Urban Rural Epidemiology study, including patients from 17 countries on five continents, showed that awareness, diagnosis, and control of hypertension were lower in low-income countries compared with other countries and in rural settings compared with urban areas[6]. Considering the disadvantages of the vulnerable population, the COVID-19 pandemic highlighted the importance of addressing health disparities to ensure that all individuals have access to the care they need. Some of the difficulties in the population-level management of hypertension for minorities are barriers to healthcare, awareness, and understanding of the importance of monitoring, which is often linked to social determinants of health such as poverty, cultural beliefs, illiteracy, discrimination, and language barriers[7].

In the current era, the increasing use of mobile applications and telemedicine for communication has the potential to bridge disparities and play a significant role in managing hypertension in outpatient settings. A study by Freund *et al*[8] suggests that even elderly patients can effectively use online interventions as an inexpensive way to find answers to their health-related questions and improve their medical knowledge[8]. To address the global burden of hypertension, the Lancet commission encourages governments, pharmaceutical companies, healthcare professionals, and professional societies to develop simple mobile apps and online education programs to provide equal basic health access to people in low-income and middle-income countries[9]. In sync with this concept, the study conducted by Andrianto *et al*[1] reveals the importance of anti-hypertensive education in lower-middle-income countries. They found that virtual anti-hypertensive educational campaign implementation led to a significant improvement in the knowledge and attitude of patients with hypertension; however, it did not reflect a change in patient practice in taking measures against hypertension[1].

We are curious as to why a prospective study such as this with robust methodology could detect an improvement in facets of hypertension management but could not alter patient behavior. The education provided by Andrianto *et al*[1] was mainly directed toward the Dietary Approaches to Stop Hypertension (DASH), which is known as one of the most effective dietary interventions to lower blood pressure (BP)[1,10]. While dietary changes constitute a part of the non-pharmacologic therapy of hypertension, trials have shown that DASH dietary pattern reduced BP by 6/4 mmHg compared to a typical American-style diet[11]. Interestingly, and contrary to popular belief, dietary salt restriction is not a constituent of the original DASH dietary approach. In a systematic review of well-controlled randomized control trials, sodium restriction was associated with a reduction of BP by 4.8/2.5 mmHg in hypertensive and 1.9/1.1 mmHg in normotensive patients, respectively[12]. The benefits of dietary

sodium restriction coupled with the DASH approach were only later studied[10]. Given the heterogeneity in the approach, we would like to know how much emphasis was placed on salt restriction education in the population. Further, the authors set the level of significance for practice-changing reduction of systolic BP at 10 mmHg. It is possible that since the primary education was directed at dietary changes amongst the non-pharmacologic measures, this reduction was not detected due to a higher set threshold. Upon reviewing Table 1 of the study, it appears that the intervention did not educate heavily on the importance of physical activity and weight loss. Multiple studies have shown that weight loss effectively reduces systolic blood pressure (SBP) and diastolic BP, and 10 kg of weight loss may lower SBP by 5 to 20 mmHg[13,14]. Integrating this could have potentially led to detecting a significant change in behavior. This is important, especially since a sedentary lifestyle is a well-known contributor to hypertension, accelerated due to the restrictions and lockdown measures during the COVID-19 pandemic.

The other reason could be a limited time of education and a lack of other intervention components. According to the behavior change wheel model, ten different intervention functions have been suggested, some of them being education, incentivization, persuasion, training, and enablement[15]. Given the complexity of behavior change required in hypertension; applying those intervention elements, such as providing patient-centered, tailored information and feedback by the healthcare professionals, would be required. Virtual education can also be tailored to an individual's specific needs and preferences. For example, some virtual programs may offer personalized meal and exercise plans, while others may provide resources and support for stress management or medication management. Although the study by Andrianto *et al*[1] did not show a major behavior change, it greatly impacted the patient's perception towards not stopping medications when the BP is under control. This is another achievement of this study, as patients obtained that awareness after education.

Lastly, we noticed that the inclusion criteria were all patients with a diagnosis of hypertension. Did the authors sub-stratify their findings for the etiology of hypertension (essential *vs* secondary)? It would be valuable to learn how many patients amongst the included 110 participants had secondary/renovascular etiology of hypertension, especially since Table 2 indicates that 30 participants were < 40 years, which is when secondary hypertension is more prevalent. Both pharmacologic and non-pharmacologic measures differ for secondary hypertension and could be a reason for not reflecting in the behavioral change of patients.

To conclude, this randomized clinical trial has nicely addressed the importance of virtual hypertension education in the current pandemic, showing an impact on knowledge and attitude specifically. Future studies could focus on the effect of behavior coaching and personalized interventions such as texting patients or following up *via* telemedicine by healthcare providers to change behavior on medication adherence, lifestyle, and BP monitoring. These interventions would make an impactful effect on health promotion when used as an adjunct to management of hypertension and reduce the risk of complications and hospitalizations.

FOOTNOTES

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