

Physician perceived barriers and solutions to DASH diet recommendations for hypertension prevention and management

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Research

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Abstract

Background

The Dietary Approach to Stopping Hypertension (DASH) is proven to lower systolic and diastolic blood pressure up to 7.8 and 3.7 mmHg, respectively and is considered first-line therapy per national guidelines. Yet, implementation into clinical practice remains suboptimal.

Methods

We designed a provider survey to identify and characterize physician-identified barriers to providing DASH diet to eligible primary care patients to reduce blood pressure. The survey assessed four domains: (1) provider beliefs/knowledge of DASH benefits (2) patient characteristics influencing likelihood of recommendation, (3) practice barriers to provision of DASH diet advice/education, and (4) resources necessary to facilitate use. We conducted qualitative interviews with 4 primary care physicians and designed a 7-item Likert scale-based survey.

Participants: University of Colorado affiliated primary care clinics and School of medicine faculty providers working in Denver metro.

Results

The survey was sent electronically to 149 providers, with 49 (33%) responders. Most providers (65%) believed DASH diet is as effective at lowering blood pressure as adding a medication for patients with pre-hypertension and established hypertension. Providers identified perceived low patient motivation (88%) and low ability to implement DASH diet into patient's lifestyle (88%) as patient factors influencing their decision to provide DASH diet education. The most significant practice barriers were lack of time (71%) and lack of patient-directed educational resources (67%). Resources providers would find useful included resources accessible through the electronic medical record, (88%), a dietician (83%), and printed patient education materials (59%).

Conclusion

Most physicians believe DASH diet is effective at lowering blood pressure. The most common barriers to providing DASH education are low perceived patient ability or motivation, lack of provider time, and lack of patient-directed educational resources. Providers identified that readily available electronic and printed materials and access to dieticians would help improve DASH counseling in practice.

Background:

Chronic hypertension contributes to 25% of cardiovascular-related morbidity and mortality (stroke, chronic heart Disease, coronary revascularization, or heart failure)¹, and affects 29% of the US population². Hypertension control is an area of focus for many healthcare systems, driven in part by quality

measurement within many value-based programs, including the Medicare Incentive Payment Program (MIPS)³. According to the American College of Cardiology 2017 guideline for high blood pressure in adults, lifestyle modification is first-line therapy for patients with elevated BP (SBP 120–129 and DBP < 80), or stage 1 hypertension (SBP 130–139 or DBP 80–89) with an ASCVD 10-year risk of < 10%¹. The Dietary Approach to Stopping Hypertension (DASH), first published in 1997, is proven to lower systolic and diastolic blood pressures by 4.5 to 7.8 mmHg and 2.6 to 3.7 mmHg, respectively, compared to usual diet controls in treated and untreated hypertensive patients⁴. This compares to blood pressure lowering of 6–9/4–5 mmHg for addition of a blood pressure such as lisinopril, amlodipine, or chlorthalidone^{5,6,7}.

Despite the DASH Diet's effectiveness, DASH diet education implementation into clinical practice is suboptimal. The National Health and Nutrition Examination Survey (NHANES) from 1998 to 2004 studies showed that less than 1% of U.S. population consumes a diet consistent with DASH^{8,9}. An NHANES study examined an individual's degree of adherence to target for the nine food categories outlined within the DASH regimen (total fat, saturated fat, protein, fiber, cholesterol, calcium, magnesium, potassium, and sodium) by using DASH accordance score. Depending on specific target values of the nine DASH nutrients, points were added to one, half, or no points. Americans with diagnosed and undiagnosed hypertension met less than 3 out of 9 of these targets¹⁰. A manual chart review of outpatient visits where blood pressures were in the elevated stage 1 hypertensive range at an internal medicine clinic in our own system found documentation of DASH diet counseling in only 2 out of 330 visits within a one-month period.

Multiple factors contribute to the low level of DASH diet implementation, including the US food environment, socioeconomic factors, clinical factors, and patient knowledge. The first step to a patient making lifestyle changes to reduce blood pressure is often advice from their physician. However, a host of barriers prevent physicians from recommending dietary and other lifestyle changes¹¹. Physicians cite lack of time to provide proper counseling on general nutrition, perception that patients lack interest and motivation in making lifestyle changes, and lack of training in nutritional counseling as barriers to consistent provision of life-style advice to patients, though data specific to DASH diet is lacking^{8,11,12,13}. One observational study showed provision of lifestyle counseling was associated with longer clinic visits ($r=-0.32$, $P < 0.001$). Specifically, each additional lifestyle counseling point (e.g. smoking cessation, low-sodium diet) was associated with 2.05 min increase in visit length¹⁴.

Regular provision of lifestyle advice, including DASH diet, has the potential to positively impact a large number of patients, and provider advice is a potentially influential first step. Clarity of the most important provider reported barriers related to patient characteristics, practice setting, and resources could facilitate development of more effective/ useful educational materials. This study aimed to identify provider-identified barriers to provision of DASH diet to patients who may benefit for lowering of blood pressure.

Methods:

This cross-sectional study was conducted from December 2019 to January 2020 at the University of Colorado Anschutz Medical Campus with General Internal Medicine, Family Medicine, and geriatrics providers. This study was reviewed by the Colorado Multiple Institution Review Board and granted exempt status.

Population and setting:

The University of Colorado School of Medicine faculty providers who care for patients at 149 different family medicine, general internal medicine, and geriatric clinics across the Denver/Boulder metro area. The system uses Epic as an electronic medical record. Within this platform, patient educational materials related to hypertension, low sodium diet, DASH diet, and anti-hypertensive medication are available through a third-party vendor

Survey Questionnaire and Data Collection

A self-administered questionnaire was developed based on qualitative interviews with five primary care providers that included open-ended questions covering four domains (as relevant to the interviewee): (1) Provider beliefs/knowledge of DASH diet benefits (2) Patient characteristics influencing the likelihood of recommendation (3) Practice barriers to provision of DASH diet advice/education (4) Resources that are or would be useful [Appendix A]. Interviews were conducted until data saturation was reached and no new information or themes were reported. Provider responses to the qualitative survey were compiled and used to inform a 7-item Likert-scale based self-administered questionnaire.

The built-in Microsoft survey link was sent via email to all CU Medicine primary care providers in December, 2019, with a second request sent 10 days later.

Data Collection and Analysis

Survey data was collected electronically and anonymously. Descriptive statistics were used to describe provider-identified barriers to the provision of lifestyle advice, including the DASH diet. All survey results were reported as percentages.

Results:

Among 149 primary care providers who received the email, 49 (33%) responded to the survey [Table 1]. About two thirds (n=32, 65%) of physicians believe that the DASH diet is at least as effective at lowering BP in adherent patients as adding a medication. The most commonly identified patient-related barriers reported were low perceived patient motivation (90%) and low patient ability to implement the DASH diet (86%), while the most commonly identified practice setting barriers were lack of time and lack of patient-directed educational resources, with 71% and 66%, respectively, reporting these as somewhat to very significant factors.

When physicians were asked about methods or resources they frequently use to educate patients about DASH diet, most reported verbal education (39%), and sometimes electronic resources currently available through the EMR (27%). The resources they reported would be most useful were electronic materials accessible through the EMR (88%), dieticians (82%), and printed materials (59%).

The workflow physicians considered most appropriate for DASH diet education was one where patients with hypertension and pre-hypertension who are interested and motivated to make lifestyle changes receive referral to a group class led by a dietician (86%), with the majority of physicians (57%) also approving of a process where all hypertension and pre-hypertension patients receive a short description of the DASH diet with the written materials during a hypertension or preventative visit.

Finally, 88% of the providers believe that DASH diet advice should be provided to patients who might benefit from the DASH diet and for those who might only learn DASH diet education through a healthcare provider (Figure 1).

Discussion:

Overall, this study demonstrates that most primary care providers believe that the DASH diet effectively reduces blood pressure compared to adding a medication. However, provider- perceived patient- characteristics, time, and lack or perceived lack of accessible patient education materials limit the provision of DASH diet counseling in pre-hypertension and hypertension patients likely to benefit.

Most physicians perceived lack of patient motivation (90%) and ability to implement the DASH diet (86%) as significant barriers, which is consistent with previous studies of physician views towards nutritional advice.^{11,12} Although physician perceptions do not necessarily reflect actual patient motivation and ability, there is evidence of some truth to this viewpoint, at least in some populations. A study evaluating DASH diet acceptability and adherence in an African American community of low socioeconomic status patients identified cost, personal preference of food, poor availability of healthier food stores, and cultural aspects as barriers to DASH diet adherence¹⁵. However, such barriers may be surmountable. A randomized pilot trial assessing DASH diet adherence for under-resourced communities reported that an intervention involving multiple peer-group sessions involving shared DASH diet meal plans, grocery shopping ideas, and budget management increased fruit and vegetable intake compared to a control group who only received a DASH diet educational packet¹⁶. Thus, to improve the patient's ability to implement the DASH diet, a healthcare team and even supportive peer programs should be developed to provide individualized plans for patients to follow.

Lack of time for patient education is a frequent barrier, with 71% of providers reporting it as a barrier to DASH diet counseling comparable to other studies where 76–81% of providers report this as a barrier to dietary counseling^{12–14,17–19,21}. One study estimated that providing USPSTF recommended nutritional counseling points requires 8 minutes¹⁸, which is one third to one half of a general clinic visit, which takes 16–30 minutes according to 2016 CDC statistics²⁰. This indicates that lack of time is a significant

practice barrier, and delivery all the services recommended by USPSTF may simply not be feasible¹⁸. Thus, developing a toolkit and resources are potential sources to facilitate the physician's nutritional counseling efforts in limited time.

Development of effective and accessible educational resources seems like a logical solution to this issue and was supported by survey respondents. Interestingly, educational resources, including the DASH diet, already existed in their EHR, in Spanish and English, with the ability to attach to an after visit summary or print out directly, but were apparently unknown to the 32 survey respondents, given 66% reported their absence as a significant practice barrier. This study did not examine why physicians were not utilizing resources that already exist, but this is likely not unique to our institution. One study reported the resources and tools are not individualized to the institutions or easily disseminated to the patient, providers, and all other practices²¹, causing difficulties for practitioners to locate resources. More focused research should evaluate the low uptake of existing tools and resources.

Deficiencies in nutrition training was identified as a barrier by just 38% of the physicians, which is somewhat less than the 46–59% of primary care providers in Croatia and Switzerland considering this a significant barrier^{11,12}. In U.S medical schools, students and most educators consider current nutritional education inadequate, despite the efforts and developments of nutritional counseling programs for the past decades^{19,21}. Providers universally endorsed access to dietitians to provide nutritional counseling, in accordance to a previous study where 84.9% of physicians considered dietitian involvement to be beneficial for sodium counseling in hypertension patients¹⁷. In addition to more detailed dietary and nutrition expertise, a dietitian also provides an extension to provider education, addressing the barrier of provider time. In one study demonstrated that dietitian's involvement in outpatient settings for DASH diet and exercise counseling program improved patient's cholesterol, blood pressure, and weight management²². Similarly, a PREMIER study showed better uptake of the DASH diet, achieved dietary reference index (DRI) recommendation in most nutrients, and reduced blood pressure in participants with multiple group sessions led by dietitians compared to control group 30-minute counseling session²³. Thus, dietitians provide positive outcomes to patient's DASH diet uptake. Meanwhile, further research should be conducted to identify strategies and the benefits in dietitian's participation in the U.S primary care settings.

This study is limited by a relatively small sample of university-based primary care practitioners. Second, this survey was built and responded by the provider's perspective, limiting the view of the patients' side. A provider's perceived patient barriers may be influenced by their own biases, and may not accurately reflect the motivation, means, grit, and resourcefulness of their patients. More studies need to focus on the patient's perceived barriers and the actual patient barriers to confirm the result that we found. Third, the cross-sectional survey does not provide the relationship between the cause and effect of the response, limiting analysis of the result. However, this study has multiple supportive studies to mitigate this problem.

Conclusion:

Providers identify perceived patient inability or unwillingness to implement DASH diet, lack of time, and real or perceived lack of accessible resources as significant barriers to advising patients to follow DASH. Interventions to increase provision of DASH dietary advice should focus on identifying eligible and willing patients, easy or automated dispensing of appropriate educational materials, and expanded access to dietitians.

Declarations

Acknowledgements and Conflicts of Interest:

This study does not have contributors who are not authors, and received no external funding. The authors no conflicts of interests to declare. This work was presented in abstract form at the Pharmacy Quality Alliance (PQA) Annual Conference on May 7, 2020.

Ethical Approval and Consent to participate: This study was reviewed by the Colorado Multiple Institutions Review Board and granted exempt status

Consent for publication: Not applicable

Availability of supporting data: The datasets used for the current study are available from the corresponding author on reasonable request.

Competing interests: The authors declare that they have no competing interests

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Author's contributions: HP conducted focus groups, performed the background chart review to assess baseline provision of DASH diet advice, designed the survey, compiled the results, and drafted the manuscript. SB supervised the focus groups, contributed to survey design, and analyzed and interpreted the results, and was a major contributor in writing the manuscript. LS contributed to the design of the survey and analysis of the results. All authors read and approved the final manuscript

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Tables

Table 1. Survey Questions and Responses [n (%)]

	Significantly less effective	A little less effective	About as effective	A little more effective	Significantly more effective
1. How effective do you believe the DASH diet is, for an adherent patient, at lowering BP compared to adding a medication?	3(6)	14(29)	24(49)	5(10)	3(6)
		Not a factor	Minor factor	Somewhat significant factor	Very significant factor
2. What patient characteristics make you less likely to recommend DASH diet or other dietary therapy to reduce blood pressure?					
Low income		6 (13)	5 (31)	19(40)	8(17)
Lack of familial support		6 (13)	16 (33)	17(35)	9(19)
Low health literacy		2 (4)	17 (34)	18(37)	12(25)
Very high BP so diet not likely to be sufficient		4(8)	11(22)	21(43)	13(27)
High complexity/concurrent disease states		4(8)	11(22)	20(41)	14(29)
Perceived low ability of patient to implement DASH diet		0(0)	6(12)	22(45)	20(41)
Perceived low patient motivation		2(4)	4(8)	19(40)	24(50)
		Not a factor	Minor factor	Somewhat significant factor	Very significant factor
3. What barriers do you face in practice that prevent you from providing DASH diet education?					
Personal lack of belief in		31(65)	12(25)	4(8)	1(2)

DASH effectiveness				
Lack of formal training on the DASH diet	12(25)	18(38)	11(23)	7(15)
Lack of dietitian to whom I can refer	16(33)	8(17)	10(21)	14(29)
Lack of patient-directed educational resources	6(13)	10(21)	17(35)	15(31)
Lack of time to explain	4(8)	10(21)	16(33)	18(38)
	Rarely or never use	Occasionally use	Frequently use	
4. What resources do you currently use to recommend DASH diet, if any?				
Verbal education of diet during visit	4(8)	26(53)	19(39)	
Electronic resources currently available in Epic	22(45)	14(29)	13(27)	
Dietitian	20(41)	22(45)	7(14)	
Printed materials describing the DASH diet available through my practice site	29(59)	17(35)	3(6)	
Websites	32(65)	14(29)	2(4)	
Printed materials describing the DASH diet I have personally collected	41(84)	5(10)	1(2)	
	Not useful	Somewhat useful	Very useful	
5. What resources would you most find useful to provide DASH diet and other lifestyle advice?				
Additional training on the DASH diet	16(33)	19(39)	14(29)	
List of good websites	10(20)	17(35)	22(45)	
Printed materials that I could hand to patients	3(6)	17(35))	29(59)	
Access to dietitian for patient referrals	0(0)	8(16)	40(82)	
Electronic resources in Epic to add to AVS or print	0(0)	6(12)	43(88)	

	Not appropriate	Somewhat inappropriate	Somewhat appropriate	Very appropriate
6. How appropriate are the following processes for implementing dietary education for eligible patients in your practice?				
All HTN/pre-HTN patients have a visit with their PCP to specifically discuss DASH diet	11(22)	11(22)	21(43)	6(12)
All HTN/pre-HTN patients receive a referral to a dietician or group class led by a dietician	4(8)	10(20)	26(53)	9(18)
All HTN/pre-HTN patients receive brief (2 min) description of the DASH diet, plus written materials during HTN or preventive visit	1(2)	3(6)	17(35)	28(57)
HTN/pre-HTN patients who express interest and motivation to receive a referral to a dietician group class led by a dietician	0(0)	1(2)	6(12)	42(86)

Appendix: Provider Qualitative Survey

1. What benefits do you believe the DASH diet provides to patients with elevated blood pressure?

2a. What patient characteristics make you more likely to recommend DASH diet? (e.g. BP level, history of adherence to treatment, concurrent disease states, etc.)

2b. What patient characteristics make you less likely to recommend DASH diet?

3. What barriers do you face in practice that prevent you from recommending or educating on the DASH diet?

4. What resources do you currently use to recommend DASH diet, if any?

5. What resources would be most useful to you to support education of DASH to patients and other lifestyle modifications?

Example resources include (but are not limited to).

- Brochure or folder of written information

- Internet educational resources
- Patient decision aid
- Availability of dietician or cooking classes to which you could refer patients
- EPIC resources that could be given to a patient with their after-visit-summary

Figures

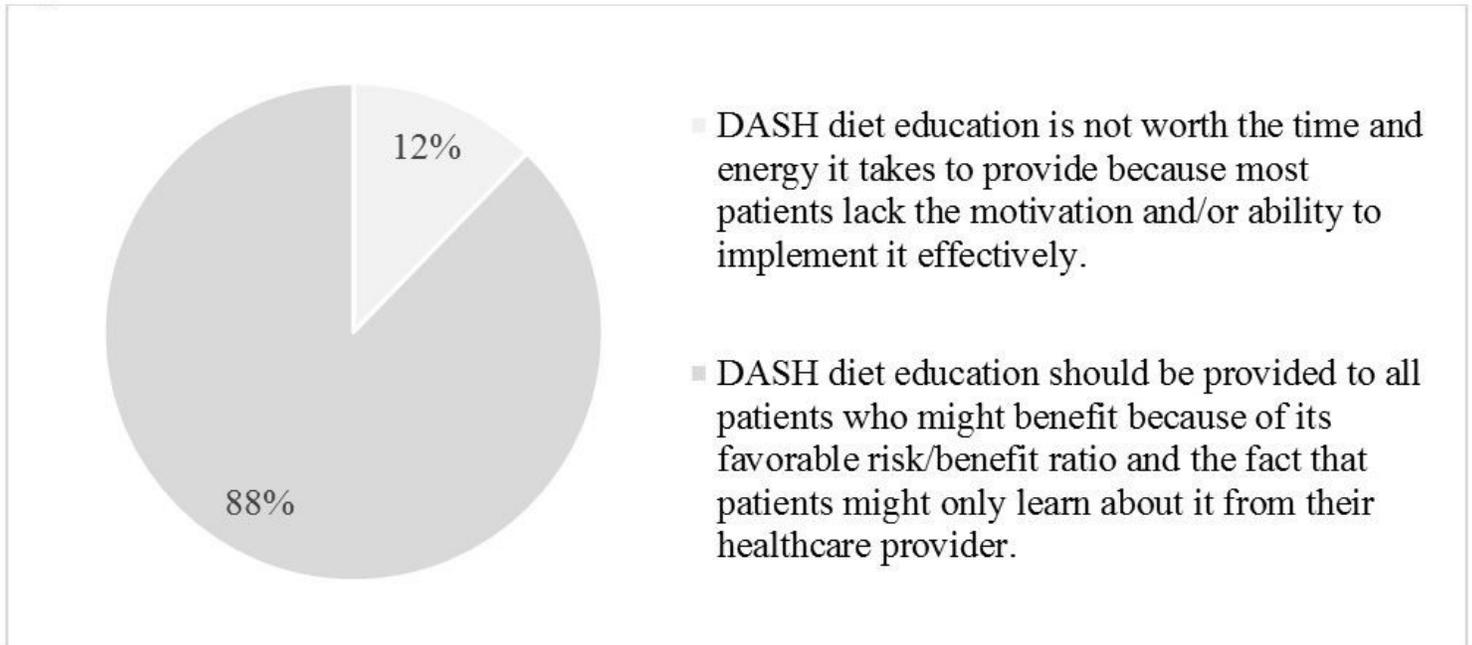


Figure 1

Please indicate which statement most closely resembles your opinion on providing DASH diet advice.

Supplementary Files

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- [DASHletter20201012.doc](#)