

Positive Deviance: Frequent Blood Pressure Monitoring Among Non-hypertensive Middle-aged Women in Rural Indonesia

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ABSTRACT

Background: In Indonesia, as in many low and middle-income countries, hypertension is a significant health issue. Community health nurses need to identify those with early onset of hypertension by promoting frequent blood pressure (BP) checks, even among those with normal BP. Positive deviance approaches focus on identifying people who undertake uncommon preventive actions. Among middle-aged women in rural West Java, Indonesia, we aimed to identify covariates of the positive deviant practice of having one's BP checked at least once every three months even when having normal BP. **Methods:** We conducted a cross-sectional survey recruiting participants at health centers. Our structured questionnaire measured socio-demographic characteristics, frequency of BP checks, BMI, beliefs and practices. We used binomial logistic regression to identify covariates. **Results:** Among 520 participants, 265 had normal BP, and of those 156 had obtained frequent BP checks, making them positive deviants. For women with normal BP, significant covariates of obtaining frequent BP checks were: 1) having BMI ≥ 25.0 (adjusted odds ratio (AOR) = 2.57, 95% confidence interval (CI) = 1.39–4.78), 2) greater tendency to seek health information (AOR = 1.13, 95% CI = 1.03–1.24), 3) receiving less support from family members (AOR = 0.87, 95% CI = 0.77–0.97), and 4) receiving greater support from health volunteers (AOR = 1.12, 95% CI = 1.01–1.23). **Conclusion:** Positive deviants were more likely to be proactive because of the convergence of their own individual-level tendencies to learn about their health, family-level conditions that allowed for greater autonomy, and community-level capacity of health volunteers to provide them with support. Community health nurses should focus simultaneously on activating individual-level, family-level, and community-level capacity to prevent hypertension.

Keywords: Blood pressure screening, middle-aged, women, rural, positive deviance.

INTRODUCTION

In low- and middle-income countries (LMICs), large proportions of populations have undiagnosed hypertension.¹ Frequent blood pressure (BP) checks are an important modifiable health practice for preventing and controlling hypertension, and thus reducing subsequent complications. In high-income countries, the importance of home-based self-monitoring of BP to reduce and control BP is well established in the literature.^{2,3} Frequent home BP monitoring is associated with decreased cardiovascular events and mortality.^{4,6} In LMICs, many people in rural communities have limited access to preventative screening through home BP monitoring devices.⁷ ⁸ In limited-resource settings in LMICs, here is an urgent need to facilitate frequent BP checks, particularly in at-risk populations.⁹

Worldwide, several factors have been found to be associated with frequency of BP checks. Less frequent BP checks have been associated with socio-demographic characteristics such as lower education,¹⁰ lower income,^{11,12} not having hypertension,^{11,13} and living in a rural area.¹² Indonesia has an extensive network of *pusat kesehatan masyarakat: puskesmas* (community health centers) and *pos pelayanan terpadu: posyandu* (health posts) that provide monthly preventive healthcare services, including checking BP.¹⁴ However, in Indonesia as in many LMICs, little is known about factors that effectively promote frequent BP checks.

In community health, researchers have recently taken more interest in studying positive deviance.^{15,16} Positive deviants are individuals who deviate substantially from the norm in that they engage in uncommon favorable behaviors, practices or habits despite living in the same group as the majority or facing the same difficult conditions as the majority.¹⁷ The positive deviance approach to health promotion focuses on studying and highlighting people who successfully discover solutions based on assets in their communities.¹⁷ The approach of studying positive deviants can be applied even in limited resource settings because in some cases the solutions are within the community. The first step in this approach is to identify positive deviants, and then study what they are doing and why.

In this study, in rural communities in West Java, Indonesia we sought locate and study middle-aged women who were positive deviants in that they had obtained frequent BP checks even though they had normal BP. Hypertension prevention in middle-aged women is important because they may experience increased arterial stiffness due to estrogen decrease, which leads to increased blood pressure.^{18,19} The purpose of this study was to identify covariates of practicing frequent BP checks among these non-hypertensive women.

METHODS

Study Design, Sample, and Operational Definition of Positive Deviants

In a rural district of West Java, Indonesia, in December 2016, we conducted a cross-sectional survey. We recruited 530 middle-aged female participants from two community health centers. Inclusion criteria were: 1) self-identifying as female, 2) ages 40-64, and 3) living in one of the communities in the district. Exclusion criterion was: not agreeing with participation in the study. Having a healthcare professional check one's BP once or more every three months is recommended by the Indonesian Ministry of Health. We developed and administered a structured paper-and-pencil questionnaire in Bahasa Indonesia language. We collected data by having research assistants ask a participant face-to-face each questionnaire item and then recording the participant's answers on the questionnaires because some of the participants had somewhat low levels of formal education.²⁰ Research assistants who were nursing students or public health students in a bachelor's degree program in the district collected all of the data. The researchers trained the research assistants on the study aims, methods, ethical considerations, and personal safety. The two research assistants worked as a pair to double-check that they were following the protocol correctly. During data collection, whenever the research assistants had questions they contacted the investigators for clarification.

We measured the outcome variable based on the intersection of two variables. First, we

assessed current BP based on the medical record where normal BP was defined as systolic below 140 mmHg and diastolic BP below 90 mmHg based on the current Indonesian guidelines for management of hypertension in cardiovascular disease.²¹ Second, we measured frequency of BP checks using a five-point Likert-type scale of 1 = never, 2 = have ever, 3 = once a year, 4 = once in three months, and 5 = once a month. We classified cases as positive deviants if they had normal BP and had checked their BP at least once in three months.²²

Questionnaire items measured participants' age, level of educational attainment, occupation, monthly family income, and whether or not they had health insurance. We also asked participants to respond to 47 statements using either a four-point Likert scale (1 = never to 4 = routinely) or a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). We grouped the 47 statements for form composite measures of 1) seeking health information, 2) receiving support from family members, 3) receiving support from health volunteers, 4) receiving support from health professionals, 5) caring about others, 6) practices based on prior experiences, 7) motivated to practice healthful behaviors, 8) sense of competence, 9) devout spiritual practice, and 10) belief in Allah's gifts (*see specific items and grouping in supplementary table*).

For logistic regression modeling, a standard recommendation is to have at least 10 observations for each variable entered in a model.²³⁻²⁵ Our instrument contains 17 explanatory variables, thus requiring a sample size of 170 for each group (hypertensive and non-hypertensive).

Ethics Approvals and Consent to Participate

Informed consent was obtained from the all participants prior to the collection of the data. We explained all the eligible participants about the purpose and procedures of the study, voluntary participation, confidentiality, and right to withdrawal. We submitted our research protocol and a request for permission to conduct this study to *Badan Kesatuan Bangsa, Politik dan Perlindungan Masyarakat* (the Agency for National Unity, Politics, and Community Protection) and the *Dinas Kesehatan Kabupaten* (the District Health Office), and permissions

were obtained in 2016 (No.37/070/Rekomlit/Kesbangpol/2016, No.070/1727/Um.Peg, respectively). Ethical approval for this study was received from the Research Ethics Committee of Shiga University of Medical Science, Japan in 2016 (No.28-068).

Data Analysis

We excluded respondents from our analysis if data was missing for frequency of BP checks. We first calculated descriptive statistics for all variables. Then, we conducted bivariate analyses using chi-square tests and unpaired t-tests by comparing participants of each group (normal BP, elevated BP, and total) based on their status (frequent BP checks vs. less-frequent BP checks) against the socio-demographic characteristics and other covariates. We then conducted univariate and multivariate analyses by specifying logistic regression models to identify covariates of frequent BP checks for each group (normal BP, elevated BP, and total) while controlling for potential confounding variables. We calculated the crude and adjusted odds ratios (OR and AOR) for each variable. Statistical analyses were performed using IBM SPSS Statistics 26.0 for Windows. Significance levels were set at $p < 0.05$ for all tests. For logistic regression models, significance levels were assessed by 95% confidence interval (CI).

RESULTS

Participants' Characteristics

Of the 530 people we attempted to recruit, 100% agreed to participate in the study. We excluded 10 from analysis because of missing data of blood pressure check frequency. Among the 520 participants, 265 had normal BP, and 255 had elevated BP. Of those with normal BP, 156 were positive deviants (30% of the total sample). The mean age of the sample was 51.2 years (SD = 7.3 years). More than half of the participants had not completed primary school (58.1%) and had limited monthly family income (56.7%). The proportion of frequent BP checks was higher among participants with elevated BP status (69.8%) than among those with normal BP status (58.9%) (**Table 1**). Among those with normal BP, univariate analysis shows that

the mean of aggregated scores for those who checked their BP frequently was significantly greater than for those who checked their BP less frequently for measures of seeking health information (16.4 vs. 14.9), receiving support from health volunteers (19.2 vs. 17.8), receiving support from health professionals (16.3 vs. 15.4) and caring about others (9.5 vs. 8.9) (**Table 2**). For those with elevated BP, the only significant difference was for measures of practices based on prior experiences (15.7 vs. 14.9).

Covariates of Frequent BP Checks

A preliminary univariate logistic regression revealed that middle-aged women with elevated BP were more likely to obtain frequently BP checks (OR=1.62, 95% CI =1.12–2.32) (**Table 3**). To run multivariate logistic regression models, we created an outcome variable of frequency of BP checks (0 = less than once in 3 months, 1 = once or more in 3 months), and then we ran fully specified models to identify covariates. Among women with normal BP, models revealed that after controlling for age, BMI (which was a significant covariate with BMI ≥ 25 having an AOR=2.57, 95% CI=1.39–4.78), educational level, occupation, income, and health insurance status, participants with normal BP were significantly more likely to have had their BP checked every 3 months if they had higher aggregate scores on seeking health information (AOR =1.13, 95% CI=1.03–1.24), receiving a lot of support from health volunteers (AOR=1.12, 95% CI=1.01–1.23) and less likely if they had received a lot of support from family members (AOR=0.87, 95% CI=0.77–0.97).

We conducted analyses using data from women who had elevated BP (n = 255). Fully specified logistic regression models revealed that for women with elevated BP, the only statistically significant covariate of women with elevated BP getting a BP check once or more every 3 months was having not received a lot of support from family members (AOR=0.89, 95% CI=0.81–0.98). BMI was not a significant covariate. Additional logistic regression analysis of the total sample (n = 520) revealed that BMI ≥ 25.0 and moderate household income were significant covariates of having frequent BP checks, along with seeking health information

(AOR=1.07, 95% CI=1.01–1.14), not receiving support from family members (AOR=0.90, 95% CI=0.84–0.96), and receiving a lot of support from health volunteers (AOR=1.10, 95% CI=1.03–1.18).

DISCUSSION

This study is the first to apply the concept of positive deviance to examine frequency of BP checks in an LMIC. In among middle-aged women living a rural district in Indonesia, we found that 30.0% of participants met our definition of being positive deviants i.e., those with normal BP who obtained BP checks at least once or more every three months. This proportion was similar to proportions identified in other public health studies on positive deviants.²⁶⁻²⁸ Our study showed that those women with normal BP who had high BMI scores (≥ 25.0) were about two and a half times more likely to have their BP checked frequently. This suggests that many women in our study who had normal BP but were overweight realized that their excess weight was a substantial risk factor for developing hypertension.

Previous studies have shown that self-care for BP checks is associated with having relevant knowledge and health awareness.^{29,30} Our study shows that middle-aged rural Indonesian women with normal BP who obtained BP checks frequently had a stronger tendency to seek health information from family, friends, health volunteers, health centers, and health posts. It is important for health professionals not only to provide knowledge, but also to support people seeking and obtaining health information by themselves. Further study is necessary to explore deeply what kind of information, which sources, and how people seek information.

Our study identified another covariate for being a positive deviant – receiving support from health volunteers in the forms of expressing concern and encouragement, giving suggestions, and accompanying women when they needed to visit healthcare facilities. In rural Indonesia, a community health volunteer is a person chosen by community members who takes on the role of mobilizing their community to use basic health services like those provided at community health

Table 1. Participant characteristics

	Normal BP (n = 265)			Elevated BP (n = 255)			Total (N = 520)			P
	Checked BP frequently (n = 156, 58.9%)	Less frequent (n = 109, 41.1%)	P	Checked BP frequently (n = 178, 69.8%)	Less frequent (n = 77, 30.2%)	P	Checked BP frequently (n = 334, 64.2%)	Less frequent (n = 186, 35.8%)	P	
	n	%		n	%		n	%		
BP status									0.009	
Normal BP	-	-	-	-	-	-	156	58.9	41.1	
Elevated BP	-	-	-	-	-	-	178	69.8	30.2	
Age group			0.986			0.933			0.939	
40-49 years	74	58.7		55	71.4		129	63.5	36.5	
50-59 years	60	59.4		69	69.0		129	64.2	35.8	
60-64 years	22	57.9		54	69.2		76	65.5	34.5	
BMI			0.003			0.565			0.004	
<18.5	9	56.3		4	80.0		13	61.9	38.1	
18.5-24.9	52	47.3		62	66.0		114	55.9	44.1	
≥25.0	93	68.9		111	71.6		204	70.3	29.7	
Education			0.727			0.031			0.249	
Not completed primary school	77	56.6		108	65.1		185	61.3	38.7	
Completed primary school	50	61.0		40	71.4		90	65.2	34.8	
Completed middle school	14	56.0		19	95.0		33	73.3	26.7	
Completed high school or above	15	68.2		10	83.3		25	73.5	26.5	
Occupation			0.340			0.075			0.059	
Housewife	102	61.1		118	73.8		220	67.3	32.7	
Other work	54	55.1		60	63.2		114	59.1	40.9	
Income (Indonesian rupiah)			0.132			0.061			0.016	
< 1 million	86	60.6		114	74.5		200	67.8	32.2	
≥ 1 million - < 2 million	51	53.1		56	60.9		107	56.9	43.1	
≥ 2 million	18	75.0		8	80.0		26	76.5	23.5	
Having health insurance			0.198			0.702			0.172	
No	70	54.7		74	68.5		144	61.0	39.0	
Yes	85	62.5		104	70.7		189	66.8	33.2	

Chi-square test

Table 2. Univariate associations with frequent BP check-ups

	Normal BP (n = 265)				Elevated BP (n = 255)				Total (N = 520)				
	Checked BP frequently (n = 156, 58.9%)	Less frequent (n = 109, 41.1%)	Checked BP frequently (n = 178, 69.8%)	Less frequent (n = 77, 30.2%)	Checked BP frequently (n = 334, 64.2%)	Less frequent (n = 186, 35.8%)	P	SD	mean	SD	mean	SD	P
Seeking health information (range 7–28)	16.4	14.9	15.5	15.6	15.9	15.2	0.860	3.8	4.0	3.9	3.9	3.9	0.032
Support from family members (range 7–35)	28.3	28.7	27.0	27.7	27.6	28.3	0.261	3.0	4.5	4.0	4.1	4.0	0.047
Support from health volunteers (range 5–25)	19.2	17.8	18.2	17.5	18.7	17.7	0.002	3.1	3.4	3.3	4.0	4.0	0.003
Support from health professionals (range 4–20)	16.3	15.4	15.6	15.7	15.9	15.5	0.004	2.1	2.7	2.5	2.8	2.8	0.099
Caring about others (range 4–16)	9.5	8.9	8.8	9.1	9.1	8.9	0.015	2.0	1.9	2.0	2.2	2.2	0.457
Practices based on prior experiences (range 4–20)	15.2	15.0	15.7	14.9	15.5	14.9	0.527	3.0	2.1	2.6	2.7	2.7	0.017
Motivated to practice healthful behaviors (range 5–25)	21.7	21.5	21.4	21.1	21.6	21.3	0.256	1.9	2.0	1.9	2.2	2.2	0.178
Sense of competence (range 3–15)	12.4	12.4	12.2	12.0	12.3	12.2	0.878	1.2	1.5	1.3	1.5	1.5	0.658
Devout spiritual practice (range 4–16)	10.7	10.1	10.7	10.4	10.7	10.2	0.093	2.8	3.1	3.0	2.8	2.8	0.066
Belief in Allah's gifts (range 4–20)	18.1	18.1	18.1	18.3	18.1	18.2	0.963	1.8	1.9	1.9	1.7	1.7	0.606

Unpaired t-test

Table 3. Logistic regression model identifying predictors of frequent BP check-ups
 Outcome variable: frequency of BP check-ups (0 = less than once in 3 months, 1 = once or more in 3 months)

	Normal BP (n = 265), Nagelkerke R ² = 0.232						Elevated BP (n = 255), Nagelkerke R ² = 0.199						Total (N = 520), Nagelkerke R ² = 0.169					
	Unadjusted			Adjusted			Unadjusted			Adjusted			Unadjusted			Adjusted		
	OR	95%CI	P	AOR	95%CI	P	OR	95%CI	P	AOR	95%CI	P	OR	95%CI	P	AOR	95%CI	P
BP status																		
Normal BP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Elevated BP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Age group																		
40-49 years	1.00			1.00			1.00			1.00			1.00			1.00		
50-59 years	1.03	0.50 - 2.16	0.927	0.93	0.36 - 2.40	0.877	1.11	0.56 - 2.21	0.765	0.76	0.28 - 2.10	0.597	1.03	0.68 - 1.54	0.895	1.30	0.76 - 2.22	0.335
60-64 years	1.06	0.50 - 2.27	0.872	1.27	0.51 - 3.16	0.604	0.99	0.52 - 1.88	0.974	1.01	0.47 - 2.17	0.986	1.09	0.68 - 1.76	0.724	1.31	0.69 - 2.50	0.406
BMI																		
< 18.5	1.43	0.50 - 4.12	0.504	1.99	0.61 - 6.49	0.256	2.06	0.22 - 19.25	0.525	2.83	0.23 - 34.43	0.414	1.28	0.51 - 3.23	0.597	1.82	0.67 - 4.95	0.238
18.5-24.9	1.00			1.00			1.00			1.00			1.00			1.00		
≥25.0	2.47	1.46 - 4.16	0.001	2.57	1.39 - 4.78	0.003	1.30	0.75 - 2.26	0.348	1.02	0.54 - 1.95	0.945	1.87	1.29 - 2.72	0.001	1.67	1.10 - 2.55	0.017
Education																		
Not completed PS	1.00			1.00			1.00			1.00			1.00			1.00		
Completed PS	0.61	0.23 - 1.59	0.311	0.49	0.14 - 1.74	0.271	0.37	0.08 - 1.76	0.212	0.22	0.04 - 1.25	0.088	1.19	0.78 - 1.80	0.426	1.38	0.80 - 2.36	0.247
Completed JHS	0.73	0.27 - 1.98	0.536	0.53	0.15 - 1.84	0.318	0.50	0.10 - 2.54	0.403	0.48	0.09 - 2.71	0.407	1.74	0.86 - 3.50	0.121	2.24	0.95 - 5.30	0.067
Completed HS or above	0.59	0.18 - 1.96	0.393	0.52	0.12 - 2.28	0.384	3.80	0.31 - 47.21	0.299	3.53	0.24 - 50.87	0.354	1.76	0.79 - 3.90	0.165	2.45	0.95 - 6.30	0.063
Occupation																		
Other works	1.00			1.00			1.00			1.00			1.00			1.00		
Housewife	1.28	0.77 - 2.12	0.340	0.99	0.53 - 1.83	0.962	1.64	0.95 - 2.83	0.076	1.29	0.68 - 2.46	0.435	1.42	0.99 - 2.06	0.060	1.12	0.73 - 1.71	0.604
Income																		
< 1 million	1.00			1.00			1.00			1.00			1.00			1.00		
≥1 million - <2 million	0.51	0.19 - 1.37	0.182	0.77	0.23 - 2.53	0.665	0.73	0.15 - 3.59	0.699	1.78	0.28 - 11.21	0.541	0.63	0.43 - 0.92	0.016	0.57	0.36 - 0.89	0.014
≥ 2 million	0.38	0.14 - 1.03	0.058	0.47	0.14 - 1.56	0.219	0.39	0.08 - 1.94	0.249	0.90	0.14 - 5.63	0.908	1.54	0.67 - 3.54	0.305	1.16	0.45 - 2.99	0.760
Having health insurance																		
Having health insurance	1.00			1.00			1.00			1.00			1.00			1.00		
No	1.38	0.84 - 2.26	0.198	1.69	0.93 - 3.05	0.085	1.11	0.65 - 1.91	0.702	1.11	0.59 - 2.06	0.749	1.28	0.90 - 1.84	0.173	1.40	0.93 - 2.11	0.110
Yes	1.11	1.04 - 1.19	0.002	1.13	1.03 - 1.24	0.013	0.99	0.93 - 1.06	0.860	1.05	0.96 - 1.15	0.323	1.05	1.00 - 1.10	0.032	1.07	1.01 - 1.14	0.024
Seeking health information (range 7-28)	0.95	0.88 - 1.03	0.261	0.87	0.77 - 0.97	0.012	0.96	0.90 - 1.03	0.238	0.89	0.81 - 0.98	0.015	0.95	0.91 - 1.00	0.050	0.90	0.84 - 0.96	0.001
Support from family members (range 7-35)																		
Support from health volunteers (range 5-25)	1.12	1.04 - 1.20	0.002	1.12	1.01 - 1.23	0.031	1.06	0.98 - 1.14	0.140	1.11	0.99 - 1.23	0.075	1.08	1.03 - 1.14	0.002	1.10	1.03 - 1.18	0.007
Support from health professionals (range 4-20)	1.17	1.05 - 1.31	0.004	1.04	0.90 - 1.22	0.576	0.98	0.89 - 1.09	0.737	1.00	0.86 - 1.16	0.999	1.06	0.99 - 1.13	0.090	1.01	0.92 - 1.12	0.768
Caring about others (range 4-16)	1.16	1.03 - 1.31	0.017	1.02	0.86 - 1.22	0.805	0.93	0.81 - 1.06	0.262	0.93	0.78 - 1.10	0.393	1.03	0.95 - 1.13	0.440	1.02	0.91 - 1.14	0.728
Practices based on prior experiences (range 4-20)	1.03	0.94 - 1.12	0.525	0.99	0.88 - 1.11	0.875	1.18	1.05 - 1.32	0.006	1.18	1.00 - 1.40	0.054	1.09	1.01 - 1.16	0.018	1.05	0.95 - 1.15	0.332
Motivated to practice healthful behaviors (range 5-25)	1.08	0.95 - 1.23	0.255	1.12	0.92 - 1.37	0.270	1.07	0.94 - 1.21	0.294	1.03	0.87 - 1.21	0.722	1.06	0.97 - 1.16	0.178	1.07	0.95 - 1.20	0.272
Sense of competence (range 3-15)	1.02	0.83 - 1.25	0.877	0.97	0.73 - 1.30	0.860	1.08	0.91 - 1.28	0.384	1.02	0.81 - 1.29	0.864	1.03	0.90 - 1.17	0.657	1.05	0.88 - 1.25	0.584
Belief in Allah's gifts (range 4-20)	1.00	0.87 - 1.14	0.963	0.96	0.78 - 1.19	0.709	0.94	0.81 - 1.10	0.454	0.88	0.73 - 1.07	0.201	0.97	0.88 - 1.08	0.612	0.91	0.80 - 1.03	0.142
Devout spiritual practice (range 4-16)	1.08	0.99 - 1.18	0.094	1.06	0.96 - 1.18	0.267	1.04	0.95 - 1.13	0.413	1.06	0.95 - 1.18	0.319	1.06	1.00 - 1.13	0.067	1.07	1.00 - 1.15	0.054

posts.³¹ In Indonesia, there is a wide network of community-level health centers and health posts that emphasize prevention, early detection, and control of NCDs where community members can receive BP checks as well as counseling and health education.¹⁴ The benefits communities receive from the work of non-professional lay health workers have been shown in Indonesia and other LMICs.³² A randomized controlled trial in LMICs showed an effect of lifestyle intervention by female community health volunteers on controlling BP.³³ Health professionals need to work more closely with health volunteers to support community members' health practices. Further study is also needed in Indonesia to learn more about how health volunteers support community members.

For women with normal BP, those who received higher levels of family support were less likely to have their BP checked frequently. In rural West Java, middle-aged women's lives are often embedded within a context of strong family bonds. Providing care for older female family members is an important family value rooted in culture and religion.³⁴ Younger family members, particularly younger women, are highly involved in taking care of their older female family members by attending to their physical symptoms and spiritual needs.^{35,36} When middle-aged women live in such a highly supportive family environments, they may feel reluctant to have their BP checked frequently at health centers, health posts, or clinics because they may assume that their family members who take care of them know what is best and are doing what is necessary to care for their health. Conversely, those middle-aged women who need to be more self-reliant in terms of looking out for their own health may be more likely to seek care outside of their family circles consistently, and therefore may have a greater tendency to have their BP checked more frequently. This is one possible explanation for the association between middle-aged women with normal BP obtaining frequent BP checks and receiving less support from family members.

In our additional analysis of covariates of frequent BP checks among middle-aged women with elevated BP, we also found the association

between receiving less family support and obtaining frequent BP checks, suggesting that this may be a universal factor. Our analysis showed some indication that women with elevated BP who had practices based on their own prior experiences or those of others they knew were more likely to obtain frequent BP checks. If women with elevated BP heard about someone whose health status deteriorated for example because of a stroke due to uncontrolled hypertension, they might be able to imagine their health could deteriorate similarly and have fear about not knowing their BP levels. Community people have a right over their healthcare decisions.³⁷ In LMICs that lack health check systems based on the law, community members have to make decisions by themselves about whether and when to go have health checks. Our findings suggest that it is important to provide health information based on peers' experiences. Other studies have mentioned the importance of narratives or storytelling by peers to motivate community members.³⁸ Further study is needed to find out what types of information about peers' experiences will motivate middle-aged Indonesian women in rural areas to have their BP checked more frequently.

There were some limitations to this study. Because the data are cross-sectional, we cannot assert that there were causal relationships between the frequency of a woman getting her BP checked and the covariates identified in our analysis. Longitudinal studies are necessary to determine whether the associations we identified are causal. In addition, it is important to explore how positive deviants get their BP checked frequently. Future research using qualitative methods should be conducted to examine the processes middle-aged women in these communities engage in to have their BP checked frequently. Another limitation is about selection bias because we conducted a study in one district. We need to conduct further study to examine the situation of BP checks and their covariates in rural Indonesia.

CONCLUSION

In rural West Java of Indonesia, as is likely to be the case in many rural places in LMICs,

middle-aged women who have not developed hypertension appear to benefit in monitoring their BP frequently when they tend to seek health information in a context when they have somewhat greater health autonomy within their families, and when they can receive support from health volunteers. The convergence of these three factors shows the importance of understanding what needs to happen simultaneously at the individual level, the family level, and the community level so that preventive positive deviant practices become the norm. Our findings can be used to inform health promotion on BP screening. Activating factors simultaneously at the individual, family, and community levels is the first step for developing community health nursing approaches for primary hypertension prevention.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper.

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