



Description and Correlation of Blood Pressure Measures to Health Behaviors among Uninsured Women Receiving Physical Therapy Services at a Student-Run Clinic

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Abstract

Background: The purpose of this observational study is 1) to describe the prevalence of pre-hypertension (P-HTN) and hypertension (HTN) blood pressure (BP) measures and associated self-reported health behaviors among uninsured women at a student-run clinic (SRC) for physical therapy and 2) to analyze correlations between BP measures and the self-reported health behaviors of this population. Self-reported health behaviors included physical activity, fruit and vegetable consumption, weight management, and smoking behaviors.

Methods: Demographic information, BP measurements, and behavioral assessments were collected on patients referred to the Wayne State University-Super All Year Detroit Physical Therapy Clinic between May 2014 and April 2015.

Results: Thirty-six females (34 African-American) with a mean age of 52 (SD=9.0) years were included. Pre-hypertension and HTN BPs were identified in 55.6% and 19.4% of the women, respectively. Among women with no prior HTN diagnosis, the prevalence of P-HTN and HTN BPs was 40.0% and 10.0%, whereas the prevalence of P-HTN and HTN BPs was 61.5% and 23.1% in women with a prior HTN diagnosis. Among study participants, 50% engaged in recommended physical activity levels, 50% consumed at least five fruits and vegetable servings per day, 27.8% maintained a healthy weight, and 64.7% abstained from smoking. A significant Spearman's rank correlation was identified between a higher frequency of reported positive health behaviors and a lower systolic BP ($r=-0.369$, $p=0.027$).

Conclusions: Identification of elevated BPs or reduced adherence to recommended healthy behaviors may guide physical therapists or other health care providers to choose health-promoting interventions that enhance patients' health and wellness.

Introduction

Hypertension (HTN), a risk factor for cardiovascular disease, stroke, myocardial infarction, and renal failure, is defined as a systolic blood pressure (BP) reading of greater than or equal to 140 mmHg and/or a diastolic BP reading of greater than or equal to 90 mmHg measured on multiple occasions.^{1,2,3} Pre-hypertension (P-HTN), a predisposing factor to HTN, is defined as having a systolic BP reading of 130-139 mmHg and/or a diastolic BP

reading of 80-89 mmHg.² HTN and P-HTN have reported rates of 33% and 28%, respectively, among United States adults.¹ Furthermore, the Centers for Disease Control and Prevention (CDC) reports that African American women represent the population with the highest incidence of HTN (45.7%).⁴ *The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7)* suggests that despite substantial improvement in HTN treatment, its prevalence continues to place

a burden on healthcare delivery systems.³ Optimization of lifestyles and behaviors, including engaging in regular moderate physical activity, consuming a diet rich in fruits and vegetables, maintaining a recommended body weight, and abstaining from smoking, have each been associated with a reduction in BP.³ However, limited evidence exists regarding the incidence of and relationships among these factors in patients and clients under the care of a physical therapist (PT) in a physical therapy practice setting.

The *Guide to Physical Therapist Practice* advocates screening for cardiovascular problems, including HTN, for every patient under the care of a PT regardless of a pre-existing cardiovascular diagnosis.⁵ Prior reports suggest PTs do not consistently take vital signs, even when risk factors for cardiovascular disease, including family history and excessive body mass index, are identified.⁶ This is of specific concern because 60-75% of patients under the care of a PT in the home care and outpatient practice settings have P-HTN or HTN.^{7,8} Since chronic diseases may emerge as a result of non-compliance with positive, modifiable health behaviors, it is important to understand the relationship between lifestyles and BP in patients seen by PTs.⁹ PTs are qualified to prevent disability and to promote healthy lifestyles by making individualized recommendations that optimize physical activity, nutrition, weight management, and smoking cessation.⁹ Additionally, PTs have a critical role in promoting health and wellness, even when behaviors are not directly related to the patients' physical therapy diagnoses.^{9,10}

Improved access to preventative services, receipt of regular and effective care for chronic conditions, and availability of higher quality acute care services have been identified as factors that contribute to successfully optimizing an individual's health and wellness.¹¹ In this regard, the emergence of pro-bono physical therapy clinics, including the Wayne State University (WSU)-Super All Year (SAY) Detroit Physical Therapy Clinic, is addressing the needs of the uninsured and under-insured urban populations.¹² The WSU-SAY Detroit Physical Therapy Clinic is a student-run clinic (SRC) affiliated with the WSU physical therapy program. Its mission is to utilize a holistic approach to provide medical care and healthy life training to homeless and uninsured women and children in

an urban community. The clinic is open two evenings a week for two hours and provides physical therapy examinations, evaluations, and interventions to individuals referred from the associated SAY Detroit Family Health Clinic. The WSU-SAY Detroit Physical Therapy Clinic is housed within the SAY Detroit Family Health Clinic. Students enrolled in the WSU physical therapy program provide these services under the direction and supervision of a licensed PT.

While PTs are well-positioned to examine, evaluate, and provide intervention and referrals to optimize BP and related health behaviors, a paucity of evidence describes the incidence of or a correlation with these health behaviors in uninsured individuals under the care of a PT or in a SRC.¹³ Therefore, the purpose of this observational study is 1) to describe the prevalence of P-HTN and HTN BP measures and associated self-reported health behaviors among uninsured women at a SRC for physical therapy and 2) to analyze correlations between BP measures and the self-reported health behaviors of this population.

Methods

Research Design

This is a prospective observational study which received WSU Institutional Review Board (IRB) approval.

Sampling Criteria

A convenience sample of individuals referred to the WSU-SAY Detroit Physical Therapy Clinic from the SAY Detroit Family Health Clinic physicians was used. Study participants met inclusion criteria if referred to the physical therapy clinic with any diagnosis and were excluded if either a BP measure from the initial evaluation or a completed health behaviors questionnaire (HBQ) was not available for analysis. Data was collected between May 2014 and April 2015. Physical therapy clinic admissions for the prior year were reported at 100 patients; therefore, a similar sample size was anticipated.

Protocol

After securing a physician-signed physical therapy referral, participants were scheduled for an evaluation by a licensed PT at the WSU-SAY Det-

roit Physical Therapy Clinic. Data was gathered using an IRB-approved data collection form and stored separately from patients' medical records to ensure protection of participant information. Data collection forms were coded for each patient using a unique identifier. The coding link to each participant was secured in a locked cabinet at the site and destroyed at study completion.

Participant demographics including age, gender, referring diagnosis, and history of a prior HTN diagnosis were recorded. Recent caffeine or nicotine intake or exercise participation within the hour prior to data collection was documented. Additionally, participant self-reports of medication consumption, medication adherence, and medication type were collected. Medications were categorized as BP-lowering, diabetes control, and pain and inflammation control.

Two BP measures were recorded and averaged on the right upper extremity during the initial evaluation encounter (visit #1) and the subsequent encounter (visit #2) using an established methodology.^{3,14,15} BP measures were categorized as normal (systolic BP less than 120 mmHg and diastolic BP less than 80 mmHg), P-HTN (systolic BP between 120-139 mmHg or diastolic BP between 80-89 mmHg), or HTN (systolic BP greater than or equal to 140 mmHg and diastolic BP greater than or equal to 90 mmHg) using JNC7 classifications.^{3,14} Correlation analysis retained the numeric measures for examination. Calibrated and correctly sized aneroid sphygmomanometers were utilized for all BP measurements. Investigators were trained in valid and reliable BP measurement methodology and the accuracy of investigators measurements were confirmed using both a standardized patient and a simulation BP trainer (Laerdal Medical Corporation, Wappingers Falls, New York).

A HBQ (Appendix 1) modified from the Behavioral Risk Factor Surveillance System was administered to each participant in either written or oral format during visit #1.^{16,17} Responses for each health behavior question represented one of the five Transtheoretical Model "Stages of Change": pre-contemplation, contemplation, preparation, action, or maintenance.¹⁸ These responses have been coded in Appendix A; however, the coding was not included in the participant version of the

questionnaire. For the purpose of descriptive reporting, the "Stages of Change" were simplified into two categories: "engaged" or "not engaged." "Engaged" health behaviors included positive responses for the action or maintenance stage for physical activity, fruit and vegetable consumption, and weight management responses, whereas "not engaged" included positive responses to the pre-contemplation, contemplation, or preparation stage. For the smoking-related question, an individual was considered engaged only if in the maintenance stage. The correlation analysis retained the continuous variables with numeric values assigned to each Stage of Change (i.e. pre-contemplation assigned a value of 1, maintenance assigned a value of 5).

Data Analysis

Descriptive statistics were used to provide details of participant demographics, BP classification, and engagement or non-engagement in each of the four health behavior categories: physical activity, fruit and vegetable consumption, weight management, and smoking. Additionally, a paired t-test examined BP changes between visits #1 and #2. Blood pressure measures taken during visit #1 that met the criteria of P-HTN or HTN were combined to create a "suboptimal" BP category. A Spearman's rank correlation coefficient test analyzed correlations between the BP measure and the health behavior Stage of Change. We also examined the correlation between the average systolic and diastolic BP measures and the frequency of positive health behaviors. In other words, the additive effects of multiple positive healthy behaviors (physical activity, fruit and vegetable consumption, weight management, and smoking,) was coded as 1 if the participant demonstrated a positive behavior or 0 if the participant did not. The resulting continuous variable, ranging from 0-4, was then tested for correlations with the continuous variable of either the systolic or diastolic BP. Statistical analysis was performed using the Statistical Package for the Social Sciences, version 21, (International Business Machines Corporation, Armonk, New York) with statistical significance set at $p < 0.05$.

Results

Demographics

Thirty-six females with a mean age of 52 (standard deviation [SD]=9.0) years, ranging from 28 to 75 years, presented for visit #1. All met study inclusion criteria and consented to participation. Thirty-four were African Americans, one was Caucasian, and one was of an unknown race. Twenty-nine participants returned for visit #2. The average number of days between visits #1 and #2 was 17.8 days, ranging from two to 84 days. Referring diagnoses included low back pain (n=15, 42%), knee pain or osteoarthritis (n=10, 28%), and rotator cuff or shoulder pain (n=4, 11%). The remaining diagnoses (n=7, 19%) were represented as cerebral vascular accident, diabetic neuropathy, unspecified bone fracture, carpal tunnel syndrome, and neck pain. Recent caffeine intake was reported by 44% (n=16) of participants, and recent nicotine intake and engagement in exercise were reported by 30% (n=11) and 19% (n=7) of participants, respectively. Descriptive statistics for medication consumption, medication adherence, and medication types are reported in Table 1.

Blood Pressure Classification

Of the 36 women included in the visit #1 analysis, a P-HTN BP was identified in 20 individuals, whereas 7 met the criteria for HTN BP. At visit #2, 7 individuals were lost to follow-up. Of the remaining 29 women, P-HTN BP was identified in 15,

Table 1. Self-reported medication consumption, adherence, and types (N=36)

Medication Consumption	n (%)
Consuming any medications including prescription medications, over the counter medications, or supplements	34 (94.4)
Medication Adherence	
Consumed prescribed medication that day	27 (75.0)
Consumes medication as directed by their physician	32 (88.9)
Medication Types	
Blood pressure-lowering	24 (66.7)
Diabetes control	3 (9.4)
Pain and inflammatory control	14 (38.9)

whereas seven met the criteria for HTN BP. Table 2 provides descriptive statistics for the frequency of women meeting each JNC7 BP classification at both visit #1 and #2. Table 2 reports BP classification frequencies for women with and without a prior HTN diagnosis. This is clinically relevant because five women were identified without a documented HTN diagnosis but presented with either a P-HTN or HTN BP and may be at risk for a future HTN diagnosis. Additionally, 6 women with a current diagnosis of HTN presented with a P-HTN BP and thus may be considered at or near goal BP.^{1,2}

Of the 29 individuals who attended both visits, only 9 demonstrated changes in BP classification between the two visits. Specifically, one individual converted from a normal BP to HTN, two converted from a normal BP to P-HTN, two converted from P-HTN to HTN, three converted from P-HTN to a normal BP, and one converted from HTN to P-HTN. The average systolic BP was 126 mmHg (SD=12.98) at visit #1 and 128 mmHg (SD=15.27) at visit #2, whereas the average diastolic systolic BP was 79 mmHg at both visit #1 (SD=7.66) and visit #2 (SD=9.02), respectively. No significant change in either the average systolic BP (t(29)=-0.925, p=0.36) or diastolic BP (t(29)=0.309, p=0.76) was detected between visits #1 and #2.

Description and Correlation of Blood Pressure Category to Health Behaviors

The prevalence of participants reporting during visit #1 that they either engage or do not engage in each of the four health behaviors is reported in Table 3. Table 3 also reports participants' engagement or non-engagement in each of the four health behaviors at visit #1 by BP classification. A higher number of women with a BP classified as normal at visit #1 engaged in physical activity, identified as having positive weight management, and abstained from smoking than did women with a suboptimal BP. However, no significant correlations were identified between the BP and participant's self-reported level of engagement in physical activity (r=0.048, p=0.39), fruit and vegetable consumption (r=0.065, p=0.35), weight management (r=0.149, p=0.19), and smoking (r=0.147, p=0.20).

A significant negative correlation was identified between an increased frequency of positive health behaviors and lower systolic BP measures during

Table 2. Frequency of blood pressure classification for women with or without a prior hypertension diagnosis

	Total, n (%)	Normotensive Blood Pressure, n (%)	Pre-hypertensive Blood Pressure, n (%)	Hypertensive Blood Pressure, n (%)
Visit #1: Evaluation Visit				
All Subjects	36 (100.0)	9 (25.0)	20 (55.6)	7 (19.4)
No Prior Hypertension Diagnosis	10 (27.8)	5 (50.0)	4 (40.0)	1 (10.0)
Prior Hypertension Diagnosis	26 (72.2)	4 (15.4)	16 (61.5)	6 (23.1)
Visit #2: Second Encounter				
All Subjects	29 (100.0)	7 (24.1)	15 (51.7)	7 (24.1)
No Prior Hypertension Diagnosis	8 (29.6)	4 (50.0)	3 (37.5)	1 (12.5)
Prior Hypertension Diagnosis	21 (72.4)	3 (14.3)	12 (57.1)	6 (28.6)

Table 3. Health behavior engagement and relationship to blood pressure category at visit #1 (N=36)

Health Behavior	Frequency, n (%)	Blood pressure	
		Normal, n (%)	Suboptimal (Pre-hypertensive or Hypertensive), n (%)
Physical Activity			
Engages	18 (50.0)	7 (19.4)	12 (33.3)
Does Not Engage	18 (50.0)	2 (5.6)	15 (41.7)
Fruit/Vegetable Consumption			
Engages	18 (50.0)	5 (13.9)	15 (41.7)
Does Not Engage	18 (50.0)	4 (11.1)	12 (32.4)
Weight Management			
Engages	10 (27.8)	5 (13.9)	6 (16.7)
Does Not Engage	26 (72.2)	4 (11.1)	21 (58.3)
Smoking			
Engages	24 (66.7)	1 (5.6)	11 (27.8)
Does Not Engage	12 (33.3)	8 (19.4)	16 (42.2)

visit #1 ($r=-0.369$, $p=0.027$). In other words, individuals with a lower BP measure self-reported increased engagement in positive health behaviors. However, no significant correlations were observed when comparing the frequency of reported positive health behaviors to the diastolic BP measures in visit #1 ($r=0.042$, $p=0.809$).

Discussion

This study demonstrated that 75% of uninsured women seen for outpatient physical therapy at an

urban SRC have a BP classified as P-HTN or HTN BP during their first encounter with a PT. This affirms rates previously reported in other physical therapy practice settings.^{7,8} The findings suggest that PTs who provide care for an uninsured female population in an urban based outpatient physical therapy clinic should be vigilant to assess and evaluate BP during each encounter because it is possible that P-HTN or HTN BP measures could be identified. When high BPs are encountered, intervention, inclusive of primary or secondary prevention and/or medical referral for optimization of

pharmacologic intervention, may be indicated.¹⁵ P-HTN rates among uninsured and under-insured women in this study were higher than the expected 28% reported among adults.^{1,19} It is clinically important that individuals with no prior HTN diagnosis were identified as having suboptimal BP measures. Additionally, use of sphygmomanometry at each visit is warranted because five women presented to visit #2 with a higher BP than at visit #1.⁵ This finding suggests a need for a PT to screen BP at each encounter and then communicate this to the physician should the measure persist.

Furthermore, nearly 72% of the individuals seen for physical therapy at the SRC had a HTN diagnosis – a rate more than double the national prevalence rate of 33% and in excess of the 45.7% reported among African American women.^{4,19} Additionally, because some of the women with a known HTN diagnosis had a HTN systolic or diastolic BP measure at both visits #1 and #2, it suggests their HTN was poorly controlled.

Physical Activity

Participant's self-reported engagement in regular physical activity (50%) exceeds the CDC reports, which indicate only 21% of adults meet the recommended guidelines for exercise.²⁰ This self-reported data is not congruent with earlier findings that suggest females and individuals at or below the poverty level are less likely to meet the physical activity guidelines.²⁰ It is well documented that physical activity engagement can improve health, morbidity and mortality and is the single most important and effective intervention a PT can incorporate into every patient/client care plan for health promoting benefits.^{11,20} Physical activity improves health and fitness levels and may reduce an individual's risk of future chronic disease diagnosis. However, evidence suggests that PTs are not consistently addressing physical activity habits with their patients.²¹ A PT's choice to engage in instructional conversations regarding physical activity inclusive of associated health benefits, dosage guidelines, perceived exercise barriers, enabling and reinforcing factors, and self-efficacy toward these ends may contribute to both a patient's immediate and long-term health status. This finding is directly relevant to this study's population, half of whom self-identified as not meeting the goal criteria, because physical activity

can be an effective way to control or reduce BP measures and frequently can be performed at little to no expense to an individual.³

Fruits and Vegetables

Low consumption of fruits and vegetables is a widely known risk factor for mortality worldwide. High consumption can have a protective role for cardiovascular disease, suggesting that the 50% of study participants who are not consuming recommended amounts could increase their health benefits by increasing fruit and vegetable intake.^{25,26} The Dietary Approaches to Stop Hypertension (DASH) eating plan, which includes recommended fruit and vegetable servings, is one approach to reduce BP.^{3,15} It is noteworthy that fruit and vegetable access may be impacted by reports of fewer grocery stores in predominantly urban, African-American communities with low socioeconomic means.²⁷ Advocacy for improved healthy food access by PTs could potentially optimize patient compliance with this health behavior in the noted communities.

Weight Loss

Participant self-reports of not maintaining a healthy weight at 69.4% are below those previously reported for adult non-Hispanic black females (80.0-85.2%).²² A weight loss of even 5-10% of total body weight is reported to produce health benefits, including a decrease in BP.^{15,23} Recently the American Physical Therapy Association adopted a position supporting "diet and nutrition as key components of primary, secondary, and tertiary prevention of many conditions managed by PTs."²⁴ While entry-level physical therapy curriculum includes targeted education for health promotion and wellness, when informed about findings like ours, practicing PTs can also identify at risk individuals and make referrals to nutrition and dietary medical professionals when specific risk outside of a PT scope of care exists. Morris et al. suggest PTs embrace this expanded role by actively managing nutritional issues across the health and wellness spectrum.²⁵ Nutritional intervention is an especially important intervention among this study's population considering greater than one-third self-identified as being at an unhealthy weight.

Smoking

One-third of study participants reported engaging in smoking, which is in excess of the 17.8% reported in the general population. This finding, however, is in congruence with the 29.2% reported among individuals living below the poverty level.²⁸ The negative impact of smoking has been well documented and includes delayed healing time in skin, muscles tendons, and ligaments; elevation of BP; and poor vascular and chronic disease outcomes.^{29,30} Pignataro et al. suggest incorporating smoking cessation counseling into the physical therapy clinical care plan, because the physiologic effects of smoking will delay the restoration of all body systems during physical therapy care and beyond.³¹ Furthermore, such identification and intervention for uninsured individuals under the care of a PT could reduce health burden and direct tobacco cost incurred by individuals with economic challenges.

Correlation of Blood Pressure and Health Behavior Engagement

This study identified a significant correlation between a higher frequency of reported positive health behaviors and a lower systolic BP measure during visit #1. This finding is consistent with prior reports indicating that engagement in recommended levels of physical activity may reduce systolic BP 2-8 mmHg, a reduction of 1 kg in body weight may reduce systolic BP 1 mmHg, and adoption of the DASH eating plan may reduce systolic BP 3-11 mmHg.¹⁵ Currently, efforts by PT-provided interventions aimed at health promotion strategies that may have a direct impact on reducing BP are limited by 1) time constraints, 2) lack of interest, education, knowledge, or resources, and 3) PT self-efficacy to perform these interventions.⁹ Creating strategies to overcome these barriers are essential to reduce disability, improve function, and advance the health status of individuals under the care of PTs.³²

Changes to Blood Pressure Classifications

The 2017 Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association (ACC/AHA) Task Force on Clinical Practice Guidelines has revised the cut point for a goal BP to be

maintained at less than 130/80 mmHg for many populations and diagnoses.¹⁵ Additionally, the ACC/AHA guidelines have redefined the prior JNC7 BP classifications from three BP classifications to four; "Normal" (systolic BP less than 120mmHg and diastolic BP less than 80mmHg), "Elevated" (systolic BP 120-129 mmHg and diastolic BP less than 80 mmHg), "Stage 1 HTN" (systolic BP between 130-139 mmHg or diastolic BP between 80-89 mmHg) classification, and the prior HTN classification has been renamed "Stage 2 HTN." These new classifications, enacted after data collection for this study, will inevitably increase the rates of individuals with a diagnosis of HTN and further support the need for a PT to monitor BP at each encounter to assure adequate BP control.

Study Limitations

The Patient Protection and Affordable Care Act, implemented during the study recruitment period, likely contributed to lower than expected recruitment. It is possible that those who had previously required the service of a pro-bono clinic could now use insurance to receive PT care.³³ A type 2 error should be considered in the results of this study given the smaller than expected sample sizes. The prevalence of disease or behaviors described here may not be directly comparable to prior, larger studies due to the small sample size, though trends may still provide insight. Additionally, because the new BP classification definitions were published following completion of this study, the use of P-HTN as a classification in this study may diminish its clinical relevance going forward. Furthermore, we identified a wide variability in the span of days between visits #1 and #2, which could bias findings. Finally, our outcomes may have been influenced by participants' ability or inability to accurately and objectively self-report health behavior such as physical activity.

Future Research

Findings of this study would be further supported with larger and matching sample sizes for each categorical variable. This may include a sample size large enough to analyze each of the five Transtheoretical Model staging categories individually or in relation to each other. Additionally, we recommend a similar study design with other mi-

nority populations or in other physical therapy practice settings. Including fee for service or insurance reimbursed clinics could provide evidence of generalizability to other populations. Finally, researchers need to utilize direct or observational measurement of individuals' actual engagement level in a given health behavior to improved validity of the measures.

Conclusions

The prevalence of P-HTN and HTN BPs among uninsured women in an urban outpatient physical therapy pro-bono SRC was high. Additionally, more than half of study participants reported not engaging in health behaviors associated with an optimized BP measure. Identification of elevated or HTN BPs or reduced adherence to recommended healthy behaviors may guide PTs or other health care providers to choose health-promoting interventions that enhance patients' health and wellness.

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Disclosures

The authors have no conflicts of interest to disclose.

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Appendix 1. Health Behaviors Questionnaire

(Survey has been modified to include Stages of Change definitions utilized for analysis {in shading})

Health Behaviors and Role-Modeling Attitudes Questionnaire

Please check the statement that **BEST** describes your current behavior.

Section 1: Physical activity

The CDC defines regular cardiac/aerobic physical activity as:

Moderate-intensity (such as brisk walking, bicycling, vacuuming, gardening or anything else that causes some increase in breathing or heart rate) for at least 30 minutes on 5 or more days a week OR Vigorous-intensity (such as running, aerobics, heavy yard work or anything else that causes large increases in breathing or heart rate) for at least 20 minutes on 3 or more days a week.

Using this definition, do you engage in regular physical activity?

(Check the one best answer from the choices below.)

Yes, and I have been for more than 6 months. {Maintenance}

Yes, and I have been for less than 6 months. {Action}

No, but I intend to start within the next 30 days. {Preparation}

No, but I intend to start within the next 6 months. {Contemplation}

No, and I do not intend to start within the next 6 months. {Pre-contemplation}

Section 2: Consumption of fruits and vegetables

Do you eat 5 or more servings of fruits and vegetables a day? (Check the one best answer from the choices below.)

Yes, and I have done so for more than 6 months. {Maintenance}

Yes, and I have done so for less than 6 months. {Action}

No, but I intend to eat more servings of fruits and vegetables within the next month. {Preparation}

No, but I am seriously considering eating more servings of fruits and vegetables in the next 6 months. {Contemplation}

No, and I am not seriously considering eating more servings of fruits and vegetables in the next 6 months. {Pre-contemplation}

Section 3: Smoking

Do you smoke cigarettes? (Check the one best answer from the choices below.)

I have never smoked, or I have quit smoking for more than 6 months. {Maintenance}

Yes, but I am in the process of giving up smoking. {Action}

Yes, but I intend to quit smoking within the next 30 days. {Preparation}

Yes, but I intend to quit smoking within the next 6 months. {Contemplation}

Yes, and I do not intend to quit smoking within the next 6 months. {Pre-contemplation}

Section 4: Weight management

Do you maintain a healthy weight? (Check the one best answer from the choices below.)

(Determined healthy weight according to body mass index chart¹⁴)

Yes, and I have done so for more than 6 months. {Maintenance}

Yes, and I have done so for less than 6 months. {Action}

No, but I intend to take action to address my weight within the next 30 days. {Preparation}

No, but I intend to take action to address my weight within the next 6 months. {Contemplation}

No, and I am not seriously considering taking action to address my weight within the next 6 months. {Pre-contemplation}