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Physical Activity Initiatives: Implications for Physical Activity Promotion

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PHYSICAL ACTIVITY INITIATIVES: IMPLICATIONS FOR PHYSICAL ACTIVITY PROMOTION

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ABSTRACT

Intrapersonal factors such as attitudes, values, expectations and beliefs play an important role in initiating and maintaining exercise behaviors. The Exercise is Medicine (EiM) initiative and the National Physical Activity Plan (NPAP) are structured to promote an increase of physical activity at the population level. The primary vision of the EiM initiative is the assessment and prescription of exercise in a primary care clinical setting. The NPAP is a document presenting evidenced-based strategies and tactics across 8 different societal sectors that create opportunity for increased physical activity. Both initiatives offer valuable strategies in promoting physical activity among American citizens. However, little empirical research on these initiatives has been evaluated.

Study I is entitled*Perceptions of the Exercise is Medicine® Initiative in a Geographically-Defined Population: Implications for Effective Physical Activity Promotion into Clinical Practice*. The primary objective of this study was to examine people's perception of the Exercise is Medicine®. Specifically, we explored the perceptions of three distinct subpopulations, namely 1) the general 'patient' population, 2) primary care clinicians, and 3) undergraduate students majoring in exercise science, as these students, in theory, are likely to have been exposed to the topic of Exercise is Medicine®. A cross-sectional probability design was employed to a sample size of 179participants, 24 clinicians, 79 exercise science students and 76 from the general population (N = 179).with participants recruited from each strata (subpopulation) among the geographically defined population. Oxford, Mississippi served as the sampling frame.

Study II is entitled *The United States National Physical Activity Plan: Is it Being Integrated into Exercise Science Curriculum*?The U.S. National Physical Activity Plan (NPAP) plan provides specific evidence-based recommendations for policy and best practices to inform physical activity behavior change across 8 societal sectors, including health care; public health; education; business and industry; mass media; parks, recreation, fitness and sports; transportation, land use, and community design; and volunteer and non-profit.As such, it is pivotal that future exercise-focused health professionals are aware of the NPAP and have adequate training to help implement and facilitate the goals of the NPAP. The purpose of this study was to examine the extent to which graduate exercise science curriculum incorporates aspects of the NPAP into their curriculum.A population-based cross-sectional study design was employed. Appropriate faculty member(s) who are teaching or have taught a course related to the study topic within the past 3 years in each of the 61 U.S. institutions granting a doctoral degree in the field of physical activity will be evaluated via email questionnaire. Among the 8 societal sectors addressed in the NPAP survey questions will be asked relative to the following 3 sectors: health care; education; and transportation, land use and community design.

Both the EiM and the NPAP provide evidence-based best practices in increasing physical activity, with the possibility of doing so at the population-level. However, implementation of both initiatives remains low. Collectively, these 2 physical activity initiative studies may help to provide important prerequisite knowledge to help facilitate exercise behavior.

DEDICATION

The strength and the love my family and friends have shown as I anxiously worked my way through this process have surely kept me going all the way to the end. This thesis is dedicated to everyone who believed in me, even when I through my moments of doubt. In particular, I thank my Grandmother and Granddaddy Sanford, who have only ever seen God's gifts in me shine through, and have faithfully supported me as I pursue my dreams.

LIST OF ABBREVIATIONS

EiM, Exercise is Medicine initiative

NPAP, National Physical Activity Plan

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STUDY I:

PERCEPTIONS OF THE EXERCISE IS MEDICINE® INITIATIVE IN A GEOGRAPHICALLY-DEFINED POPULATION: IMPLICATIONS FOR EFFECTIVE PHYSICAL ACTIVITY PROMOTION INTO CLINICAL PRACTICE

INTRODUCTION

As an effort to treat and manage chronic disease, as well as prevent the progression of disease and reduce the incidence of future disease, primary care clinicians routinely assess and perform various disease-related screenings.[1-9]These clinical screenings are age and gender-specific, but specifically focus on direct screening of blood pressure, cholesterol, and diabetes.[1-9] In addition to the importance of measuring blood pressure and taking blood samples to screen for diabetes (Hgb_{A1c} or fasting glucose) and elevated cholesterol (high total and LDL-cholesterol and low HDL cholesterol), regular participation in physical activity may help to prevent hypertension, elevated cholesterol, diabetes, cardiovascular disease and premature mortality.[10]

Consequently, there is an urgent need to develop healthcare systems that support physical activity. In this regard, physical activity may be considered as the "fifth vital sign."[11-13]Encouragingly, there is evidence of feasibility and validity in integrating two brief (lasting <1 min) physical activity measures as "vital signs" during clinical visits (1. "*Do you engage in moderate-to-vigorous physical activity*?" And 2. "*How many minutes each day do you engage in activity at this level*?").[11-13]

In an effort to support physical activity assessment and promotion into the health care setting, the Exercise is Medicine® (EiM) initiative[14] was developed, which is in alignment with Healthy People 2020 objectives[15] and the National Physical Activity Plan.[16] Although the EiMinitiative[14] encourages clinicians to consider physical activity as a "vital sign" by routinely assessing and

promoting physical activity during each clinical visit, such an integration into clinical practice has not yet been fully implemented. For example, our recent publication using a national sample of Americans showed that 63.7% of American adults who had seen a healthcare professional in the past 12 months received no advice or information about exercise from them.[17] Strikingly, among adults who were completely sedentary, 55% of them received no exercise-related advice or information from healthcare professionals. Similarly, our other work also demonstrates thatduring a healthcare visit within the past 12 months, only 19.4% of overweight, 46.8% of obese class 1, 62.8% of obese class 2 and 76.9% of obese class 3 adults were advised to lose/control their weight.[18] Encouragingly, however, and demonstrating the powerful role of clinicians, our findings demonstrate that those who did indeed receive advice to lose/control weight from a health care professional were three times more likely to adopt weight loss

Clearly, efforts to integrate physical activity assessment and promotion in the clinical setting are needed. Barriers such as increasing physician and patient confidence in behavior change as well as inadequate time and/or knowledge/experience will need to be addressed to help facilitate the global EiMinitiative.[19-21]In addition to these established barriers, understanding the patient's and health care professional's perceptions of the EiMinitiative is an initial first step that is needed to help effectively integrate the EiMinitiative into clinical practice. To our knowledge, no such study exists, which, as a result, was the main objective of this study.

As defined elsewhere,[22,23] "*medicine*" often encompasses: 1) a prescription medication that a clinician may prescribe, and 2) a branch of science dealing with the prevention, treatment and management of chronic disease. Importantly, the EiM initiative encompasses both of these

parameters of medicine. However, it is plausible that the 'patient' or general population may perceive the EiMinitiative as only focusing on the first parameter listed above (i.e., a prescription medication, with "exercise" being the prescription). If this is true, then when the patient or general population thinks about or hears the term EiM, perhaps they will exclusively think of exercise as being analogous to medication, and as a result, is mostly emphasized among individuals who have a 'condition.' In theory, such a misunderstanding of the EiM initiative may have a negative impact on an individual's responsiveness to the EiMinitiative. Some may argue, however, that the general population is well aware of the beneficial, protective effects of physical activity. As a result, some may perceive that it is unlikely that people will have this inaccurate perception that the EiMinitiative is "only" focusing on those with a chronic disease. Our recent work,[24] however, suggests otherwise in that young adults are not fully aware of the preventable effects of physical activity on various health outcomes, including, for example, neurological (e.g., Parkinson's and Alzheimer's disease) and cancer-related diseases.

Similar to how a *patient's misguided or inaccurate perception of the EiMinitiativemay reduce their responsiveness to the initiative, an inaccurate perception of the EiMinitiative among clinicians may, in theory, influence their integration of the initiative into their clinical practice*. Because of these possibilities, the primary objective of this study was to examine people's perceptions of the *EiM*initiative. Specifically, we explore these perceptions within three distinct subpopulations, namely 1) the general 'patient' population, 2) primary care clinicians, specifically family-care nurse practitioners, and 3) undergraduate students majoring in exercise science, as these individuals, in theory, are likely to have been exposed to the topic of the *EiM*initiativ

METHODS

Study Design and Participants

A cross-sectional study design from a geographically-defined population (Oxford, Mississippi; located in North Central Mississippi) was employed. Participants of the general population were recruited using a multistage probability sampling approach. Oxford, Mississippi served as the sampling frame. Three strata's (general patient population, students, and clinicians) were sampled, with the general patient population sampled usinga probability sample proportional to the total number of participants within its strata.

The anticipated total sample size was 180 participants, which was determined for study Aim 4; this was based off of having at least 10 participants per predictor (8 predictors) in the logistic regression model. Our initial plan was to have an equal sample size across the three stratas, but this was not possible, as due to recruitment saturation with the clinicians, we were only able to recruit 24 clinicians. Thus, among the 180 anticipated participants, we aimed to recruit 170 participants for the two other stratas (85 for the general population and 85 for the clinicians); we purposely aimed to over sample these stratas in an anticipation of missing data.The final analytic sample included 24 clinicians, 79 exercise students and 76 from the general population (N = 179).

For the undergraduate student population at the authors' institution, 717 undergraduate exercise science students were enrolled during the study period. An email was sent to all students with a link to participate in the online Qualtrics™ survey. After three rounds of emails sent to the undergraduate exercise science student listserv, a total of 79 students chose to participate.
The clinician strata consisted of 90 family care nurse practitioners in Mississippi. Paper and pencils surveys were distributed in person. Some occurred during a work-related dinner event, with others occurring at the location of their practice or at a speaker event held at the authors' institutional campus. In total, 22 nurse practitioners completed the survey; 2 primary care physicians also expressed an interest, and were thus included (N = 24).

For the general patient population, the number of units in this strata was estimated to be N=20,088 (census data from 2012). Given our desired n of 85, the sampling fraction for this strata was equal to 0.4%, which results in an interval size, k, of 236 (N/n; 20,088/85=236). Due to time constraints and participant flow, this interval size was ratio adjusted by 0.1. As a result, every 23rd (236*0.1) participant from the general patient population were sampled until we reached our desired n of 85. If the selected participant declined the invitation to participate, another participant was selected, with this process continuing until the quota from each strata was met.Among those asked to participate, 19 declined participation. Participants were sampled from two primary locations within Oxford: as they were entering two of the primary shopping centers (Oxford Square and Belk Shopping Center). We assumed that individuals entering these locations did so in a random order. However, it is possible that certain demographic profiles (e.g., older individuals) may be more likely to shop at a particular time of day (e.g., morning) or on a particular day (e.g., Saturday). For the Oxford Square shopping center, 19 were sampled in

the morning on a randomly selected day in the week, another 10 on a different randomly selected day in the afternoon, another 19 on a different randomly selected day in the evening, and 10 on a randomly selected day on the weekend. For the Belk shopping center, 10 were sampled in the afternoon on a randomly selected day in the week and 8 on a randomly selected day on the weekend.

Measures

All measures were assessed via a questionnaire; an on-line survey was employed for the student and primary care clinician populations, with a paper-and-pencil survey that was utilized for the general patient population.

Aim 1: Examine how participants define the term 'medicine.'

To address this aim, participants were asked, "*In your own words, describe what the term "medicine" means to you*." (open-ended question)

Aim 2: Examine the extent to which participants are aware of the *EiM*initiative.

To address this aim, participants were asked, "*Are you aware of the Exercise isMedicine®initiative?"* (yes/no response option)

Aim 3: Examine participants' perception of the main objectives of the *EiM*initiative.

To address this aim, participants were asked, "*In your own words, please briefly explain what you think the Exercise is*Medicine®*initiative is referring to*." (open-ended question)

Aim 4: Identify factors that explain accurate perceptions of the *EiM*initiative.

To address this aim, participants were asked 6 questions:

1. What is your age (in years)?
2. What is your gender? (male/female response option)
3. What is your race-ethnicity (response options: Mexican American, other Hispanic, non-Hispanic white, non-Hispanic black, other race-ethnicity)
4. What is your educational attainment? (response options: < 9th grade, 9-11, high school diploma/GED equivalent, some college, bachelor's degree, master's degree, or doctoral degree).
5. Please describe your health status (response options: excellent, very good, good, fair, or poor). Due to cell size issues, this variable was recoded into the following three groups: excellent, very good, or good or worse.

In answering the following question, vigorous physical activities refers to activities that take hard physical effort and make you breathe much harder than normal and moderate activities refer to activities that take moderate physical activity and make you breathe somewhat harder than normal.

6. During the last 7 days, on how many days did you do moderate or vigorous physical activity? (response options: 0-7 days).

a. On a typical one of these days, how much time in total did you usually spend engaging in moderate-to-vigorous physical activities? (response options: hrs and minutes).

This self-report assessment of moderate-to-vigorous physical activity was developed from the short-form of the International Physical Activity Questionnaire, which has demonstrated evidence of reliability and validity in the adult population.[25] Number of weekly minutes engaging in moderate-to-vigorous physical activity was calculated by multiplying the number of days by minutes of moderate-to-vigorous physical activity.

Data Analysis

All statistical analyses were computed in Stata (v. 12). Statistical significance wasestablished as a nominal alpha of 0.05.

Aim 1: Examine how participants define the term 'medicine.'

Coding of this open-ended question followed a coding scheme of an *a-priori*set of categories, which was developed after a discussion about what information is important to capture and code. Based on the selected definition of '*medicine'*, the two primary categories included: 1) '*medicine'* defined as a branch of science involved in the "*prevention*", "*treatment*", and "*management*" of chronic disease, and 2) some type of prescription to help "*treat*" and "*manage*" disease, with no mention of any "*preventive*" effects.

Written responses from this open-ended question were reviewed by two independent authors and the proportion of participants who provide an answer that fit into these *a-priori* defined categories was calculated, with proportions stratified by subpopulation (i.e., general patient

population, student, clinician). Comparison between both independent coders were made, and when discrepancies were identified, a solution was agreed upon.

Aim 2: Examine the extent to which participants are aware of the *EiM*initiative.

The response option for this close-ended question was "yes/no." The proportion of participants aware of the *EiM*initiative was calculated, with proportions stratified by subpopulation.

Aim 3: Examine participants' perception of the main objectives of the *EiM*initiative.

Similar to Aim 1, coding of this open-ended question followed a coding scheme using an *a-priori* set of categories, developed after discussion among co-authors about what information was important to capture and code. The two primary categories included: 1) The *EiM*initiative focuses on using exercise to "*prevent*" as well as "*treat/manage"* chronic disease, and 2) the *EiM*initiative focuses on the "*treatment/management*" of chronic disease, with no mention of exercise having a "*preventive*" effect.

Written responses from this open-ended question were reviewed by two independent coders and the proportion of participants who provided an answer that fit into these *a-priori* defined categories was calculated, with proportions stratified by subpopulation (i.e., general patient population, student, primary care clinician). Comparisons between both independent coders were made, and when discrepancies were identified, a solution was agreed upon.

We anticipated a correspondence between the responses for Aim 1 and Aim 3. We calculated the proportion of participants who indicated 'medicine' deals with both the prevention and treatment of disease (Aim 1) and who indicated that the *EiM* initiative focuses on both prevention and treatment of chronic disease (Aim 3). A chi-square analysis was used to determine if this possible association was statistically significant.

Aim 4: Identify factors that explain accurate perceptions of the *EiM*initiative.

A multivariable logistic regression analysis was employed to examine selected factors that were associated with accurate perceptions of the *EiM*initiative. The outcome variable was having an accurate perception of the *EiM*, as identified from Aim 3 (i.e., that the initiative focuses on using exercise to "prevent" as well as "treat/manage" chronic disease). Independent predictors included: age, gender, race-ethnicity, education, health status, current physical activity level, aware of the *EiM*(Aim 2), and subpopulation (i.e., general patient population, student, or clinician).

Several logistic regression diagnostics were employed, including evaluation of specification error, goodness of fit and multicollinearity. These diagnostics were checked and there were no observed issues. For example, and with regard to specification error, the linear predicted value ($\beta = 1.28$, $P<.001$) was significant but the linear predicted squared value was not ($\beta = .27$, $P=.23$). With regard to the goodness of fit test, the Hosmer-Lemeshow chi-squared ($P=.63$) test was not significant. With regard to collinearity, the highest correlation between any two covariates was

r= 0.58. With regard to variance inflation factor, the highest individual variance inflation factor was 1.6.

RESULTS

Aim 1: Examine how participants define the term ‘medicine.’

A greater proportion of clinicians defined medicine as having both treatment and preventative aspects: 34.7% for clinicians, 20.2% for students, and 19.4% of the general population. However, across all subpopulations, proportion estimates were similar for defining medicine as “treatment or management with no mention of prevention”: 60.9% (clinicians), 72.9% (students), and 67.5% (general population). Notably, 4.3%, 6.8%, and 13.0%, respectively, provided an answer that did not fit into one of these a-priori defined categories. Ultimately, based on a Pearson chi-square test, there was no evidence of a differential association of perception of the term ‘medicine’ and group (clinician, student, general population), $\chi^2 = 4.72$, P=.31.

Aim 2: Examine the extent to which participants are aware of the *EiM*initiative.

Awareness of the initiative was very low, but was slightly higher among clinicians (25.0%), compared to students (20.2%) and the general population (14.2%). However, based on a Pearson chi-square test, this was not statistically significant, $\chi^2 = 1.74$, P=0.41.

Aim 3: Examine participants’ perception of the main objectives of the *EiM*initiative.

Similar to Aim 2, a greater proportion of clinicians defined the *EIM*initiative as having both treatment and preventative aspects: 45.0% for clinicians, 34.7% for students, and 32.9% of the general population. However, and unlike Aim 1, there were proportional differences across the subpopulations as to whether they viewed the EiM initiative as being preventative only or treatment/management only; 10.0%, 10.1% and 31.4% of clinicians, students, and general population, respectively, viewed the *EiM* as being preventative only. Conversely, 40%, 36.2% and 18.5% of clinicians, students, and general population, respectively, viewed the *EiM*as 'treatment or management only.' Based on a Pearson chi-square test, there was a statistically significant association between perception of the *EiM* and group classification, χ^2= 16. 13, *P*=0.013.

We did not, however, observe an association between Aim 1 and Aim 3, i.e., whether there was an alignment between perceptions of Medicine (Aim 1) and perceptions of the *EiM* initiative (Aim 3), χ^2 = 4.1, *P*=66.

Aim 4: Identify factors that explain accurate perceptions of the *EiM*initiative.

Accurate perceptions of the *EiM* was defined as perceiving the initiative as having both preventative and treatment aspects. Evaluated predictors of accurate perceptions included age, gender, race-ethnicity, perceived health status, self-reported physical activity and subpopulation (clinician, student, general population). In a single multivariable logistic regression model, women, compared to men, had a 56% reduced odds of having an accurate perception of the EiM initiative (OR=0.44; 95% CI: 0.19-1.01;*P*=0.05). The only other statistically significant predictor

was perceived health status. Interestingly, when compared to those who perceived their health as excellent, those who perceived their health as ‘good or worse’ had a 6-fold increased odds of having an accurate perception of the EiM initiative (OR=6.08; 95% CI: 1.88-19.69;*P*=.003).

DISCUSSION

The *EiM* initiative was developed in an effort to support physical activity assessment and promotion into the health care setting, although integration in the clinical setting has not been fully implemented. The primary purpose of this study was to examine people's perceptions of the *EiM*initiative in three distinct populations, namely the 'general patient' population, clinicians, and an undergraduate exercise science student population. To obtain a comprehensive understanding of these subpopulations' perception and awareness, we included 4 key aims. The first aim assessed how participants defined the term '*medicine'*. While all subpopulations were similar in defining medicine as "treatment or management with no mention of prevention"(60.9% clinicians, 72.9% students, and 67.5% general population), a greater proportion of clinicians defined medicine as having both treatment and preventative aspects. However, these percentages were much smaller for all clinicians, students, and general population at 34.7%, 20.2%, and 19.4% respectively. The second aim showed very low awareness of the initiative among clinicians, students, and the general patient population at 25%, 20.2%, and 14.2% respectively. The third aim, similar to aim 2, showed a greater proportion of clinicians (45%) defining the initiative as having both treatment and preventative aspects when compared to the 34.7% of students and 32.9% of the general population. The fourthaim sought to identify factors to explain the accuracy of perceptions of the EiM initiative, which was defined as having both preventative and treatment aspects. Women, when compared to men, were 56% less likely to have accurate perceptions of the initiative. Perceived health status was also found

to be a predictor of accurate perceptions of the initiative. Unexpectedly, those who perceived their health as 'good or worse' were six times more likely to have an accurate perception of the initiative than those who perceived their health as 'excellent.'

Previous research supports the implementation of physical activity assessments, counseling, and outside referrals during clinical practice.[14]Thisintegration may be a critical step in improving population-level health among adults.[14] However, despite the notable benefits and importance of widespread integration of the *EiM*, additional work is needed to maximize *EiM* integration into the clinical setting.In a 2012 national sample, our research showed that 36.3% of American adults who received healthcare in the past year were advised by a health care professional to increase their exercise.[17]Only 44.9% of adults who reported no participation in exercise were advised by a health care professional to increase their exercise levels. This study also showed that only 31% of overweight and 57% of obese adults were advised to increase their exercise by a healthcare professional.[17]In order to maximize proper implementation of the *EiM* initiative, it is important to assess why these implementation-related barriers exist. Among other barriers, awareness of the initiative may be a major contributor to the implementation of the EiM initiative. In the present study, all three subpopulations, on average, were unaware of the initiative. All three subpopulations, on average, also hadmisguided or inaccurate perceptions of the initiative. For example, 40% of clinicians, 36.2% of students, and 18.5% of the general patient population reported the *EiM* as having no preventative effects. Althoughspeculative, the implications of these findings could likely reduce their responsiveness to the *EiM* initiative, particularly among those aware of the initiative. Interestingly, participants with a perceived health status as 'good or worse' were 6 times more likely to have an accurate perception of the

*EiM*initiative when compared to those with a perceived general health status of 'excellent'. Women were 56% less likely to have to have an accurate perception of the initiative than men. These findings may present heightened areas of interest for future research evaluating the efficacy on the initiative. That is, and although speculative, our observed findings suggest that sex and perceived health status may be potential moderators of the initiative's fidelity and efficacy. Although speculative, a potential reason for these sex-specific findings may be because on average, women are less active than men.[26] Because they are less likely to engage in physical activity than men, they may be less inclined to perceive overall preventative and treatment benefits of physical activity. Also, and although speculative, those with greater perceived health status may have had less accurate perceptions of the initiative due to viewing it as only pertaining to individuals who are in need of a treatment or a medical intervention. As we refer to the Health Belief Model (HBM),[27] if an individual perceives their health as excellent, and/or has misguided perceptions of the effects of exercise and medicine, it is plausible they may possess low susceptibility to the health effects of inactivity. If future research confirms these speculations, future efforts focusing on increasing physical activity assessment and these populations is warranted.

Given the low awareness of the *EiM* initiative across all three specific subpopulations in this study, there is a need for increased awareness of the initiative.This study also supports the need for effortsto increase education, promotion and implementation of the initiative. Results from this study show that there may be a misguided perception of the initiative, which could affect implementation. It could be speculated that if clinicians only view the term 'medicine' as having treatment effects, they may be less likely to assess their patients' participation in physical

activity, particularly if their patient is of normal body habitus. In the same light, patients who have a misguided perception of the initiative may be less likely to adhere to physician recommendations for exercise.

According to our findings, there is also a need for the education of the preventative and treatment effects of exercise among college students and the general public. Students working towards a degree in exercise science should be high priority targets in disseminating the EiM initiative policies and strategies. They are studying to enter a career in which they will have direct contact with the general population concerning the health-related benefits of exercise. If the students are not made aware of the initiative by way of incorporation in their curriculum, they may fail to employ the important strategies into their practice in their chosen career field, as well as their personal lives.

When medicine is viewed as only a treatment mechanism for chronically diseased individuals, and if the patient is not yet chronically diseased, they may feel less susceptible to the effects of physical inactivity, or not realize the importance of exercise to remain healthy.This ideology is in support of the Health Belief Model, which posits that one's perceived susceptibility will likely play a role in whether or not the individual takes action in the health behavior. The HBM also suggests that external cues to action, for example, a medical professional, could influence an individual's likelihood to actually take action regarding thehealth behavior.

Strengths of this study include the novel topic and utilization of three populations. Limitations of this study include employing a relatively small sample size as well as using a non-nationally

representative sample. Other limitations include the self-report measures of physical activity and health status as well as using differing methodological approaches (paper-and-pencil vs. online survey) across the subpopulations. However, for those taking the paper-and-pencil surveys, participants were allowed as much time as they desired to complete the assessments.

CONCLUSION

In conclusion, these findings demonstrate not only very low awareness of the *EiM*initiative, but alsomisguided or inaccurate perceptions that may reduce responsiveness to the initiative across all subpopulations.Our findings, in part, may also help to explain the lowlevels of implementation of the *EiM* in clinical practice. Future research employing a representative sample of adults within the evaluatedstratas is needed to confirm our findings and to increase generalizability of our observations. Our findings showed that sex and perceived health status were predictors of an accurate perception of the initiative. If these findings are replicated in a representative sample, future research should aim to identify the mechanism(s) behind these associations, as well as the implications concerning the effectiveness of the initiative in these specific populations. Based on our observations, future research would benefit by examining whether indeed an inaccurate perception of "medicine" or the "EiM initiative" influences patient responsiveness to clinician promotion of physical activity as well as clinician implementation of the *EiM* initiative.Clearly, this is an exciting new area of work in need of future research that has important implications on effective education, implementation of, and adherence to the*EiM*initiative.

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APPENDIX

APPENDIX A: CHARACTERISTICS OF OUR GEOGRAPHICALLY DEFINED POPULATION

Table 1.Characteristics of our evaluated geographically-defined populations.

	Point Estimate			
Variable	**Entire sample (N=179)**	**Clinicians (N=24)**	**Exercise Science Students (N=79)**	**General Population (N=76)**
Age, mean years	31.01(SE 1.19)	46.13(SE 2.09)	20.60(SE .39)	36.92(SE 2.09)
Female, %	61	88	75	57
Race, %				
Mexican-American	1	4	-	1.5
Other Hispanic	2	-	3.5	-
Non-Hispanic White	82	96	76	83
Non-Hispanic Black	11	-	13	14
Other Race-Eth	04	-	7.5	1.5
Education, %				
<9th Grade	0.6	-	-	1.3
9^{th}-11^{th} Grade	0.6	-	-	1.3
High school dip/GED	8.4	-	15.3	4.0
Some College	55.1	-	79.5	47.4
Bachelor Degree	12.9	-	5.1	25
Master's Degree	16.3	79	-	13.2
Doctoral Degree	6.2	21	-	7.9
Health Status, %				
Excellent	25	12.5	20.3	34.2
Very good	50	75	54.4	36.8
Good	22	8.3	21.2	26.3
Fair	2.5	4.2	2.5	2.6
Poor	.5	-	1.3	-
Clinician Type, %				
MD	8			
Nurse Practitioner	92			
Currently Practicing, %	100			
Moderate-to-	255.40(SE 19.04)	115.54(SE 26.41)	301.43(SE 27.87)	255.33(SE31.90)

vigorous physical activity, min/week				

STUDY II:

THE UNITED STATES NATIONAL PHYSICAL ACTIVITY PLAN: IS IT BEING INTEGRATED INTO EXERCISE SCIENCE CURRICULUM?

INTRODUCTION

Regular participation in physical activity has been shown to provide numerous health benefits, including, but not limited to, prevention of cardiovascular, metabolic, neurological and cancer-related diseases.[1] This, coupled with the low adherence to national physical activity guidelines,[2] has prompted national organizations to develop reports/guidelines to facilitate the promotion of physical activity. For example, in 2008, the United States Department of Health and Human Services (USDHHS) developed the first government-issued physical activity guidelines. Other important government initiatives that have been developed to promote physical activity include the Healthy People 2020, the Physical Activity Guidelines Advisory Committee Report, the Exercise is Medicine Initiative, and the U.S. National Physical Activity Plan (NPAP).

With regard to the U.S. NPAP, the plan provides specific evidence-based recommendations for policy and best practices to inform physical activity behavior change across 8 societal sectors, including health care; public health; education; business and industry; mass media; parks, recreation, fitness and sports; transportation, land use, and community design; and volunteer and non-profit. As such, it is pivotal that future exercise-focused health professionals are aware of the NPAP and have adequate training to help implement and facilitate the goals of the NPAP. In a 2013 study by Evenson et al.,[3] and among 291 members of the National Society of Physical Activity Practitioners in Public Health, 79% reported awareness of the NPAP. Among these individuals aware of the NPAP, few participants (15%) reported using the plan at least 6 times.

Although speculative, inadequate use may be a result of inadequate knowledge of the NPAP, and in particular, inadequate educational training of the NPAP.

To our knowledge, no study, to date, has examined the extent to which exercise science curriculum integrates aspects of the NPAP. Doctoral students studying health behaviors are an important population to address because of their direct contact with target NPAP audiences across the various sectors as they enter into their career fields. As a result, the purpose of this study was to examine the extent to which graduate exercise science curriculum incorporates aspects of the NPAP into their curriculum.

METHODS

Study Design and Participants

A population-based cross-sectional study design was employed. Currently, there are 61 institutions granting a doctoral degree in the field of physical activity, located across 35 states.[4] Sixty of the sixty-one institutions were contacted with the exclusion of the researchers' institution. The department chair of each of the programs were contacted via e-mail and asked to provide the e-mail address of the appropriate faculty member(s) who are teaching or have taught a course related to the study topic within the past 3 years. The researcher thencontacted the appropriate faculty via e-mail and asked them to complete the survey, with responses recorded electronically using Qualtrics™ Online Survey software.

Among the 8 societal sectors addressed in the NPAP, the present study focuses on the following 3 sectors: health care; education; and transportation, land use and community design. These 3 sectors were selectively chosen for two reasons: 1) to minimize participant burden by reducing the length of the survey and 2) these 3 sectors we believe were the most likely to have been addressed in exercise science graduate curriculum.

The first question delivered to all participants was, “Are you aware of the U.S. National Physical Activity Plan?” (yes/no response option).

The following narrative identifies the specific NPAP strategies within the 3 evaluated sectors, followed by the specific questions we asked in the on-line survey. Note, the specific strategies were not identified in the survey. We piloted the survey with several content experts to evaluate clarity and appropriateness of the survey items. The survey took approximately 3-5 minutes to complete.

Health Care Sector

Strategy 1

Make physical activity a patient “vital sign” that all health care providers assess and discuss with their patients.

Question Asked

“In your course, did students learn about the importance or need for health care providers to assess and discuss physical activity as a “vital sign” with their patients? (yes/no)

Strategy 2

Establish physical inactivity as a treatable and preventable condition with profound health implications.

Question Asked

"In your course, did students learn about the effects that physical activity can have in preventing and treating various chronic diseases." (yes/no)

Strategy 3

Use a health care systems approach to promote physical activity and to prevent and treat physical inactivity.

Question Asked

"In your course, did students learn ways in which health care professionals can use a health care systems approach to promote physical activity and to prevent and treat physical inactivity." (yes/no)

Strategy 4

Reduce disparities in access to physical activity services in health care.

Question Asked

"In your course, did students learn ways to help reduce disparities in access to physical activity services in health care." (yes/no)

Strategy 5

Include physical activity education in the training of all health care professionals.

Question Asked

"In your course, did students learn about the importance or need for physical activity education in the training of all health care professionals? (yes/no)

Strategy 6

Advocate at the local, state, and institutional levels for policies and programs that promote physical activity.

Question Asked

"In your course, did students learn about the importance or need for advocating at the local, state, and institutional levels for policies and programs that promote physical activity? (yes/no)

Education Sector

Strategy 1

Provide access to and opportunities for high-quality, comprehensive physical activity programs, anchored by physical education, in Pre-kindergarten through grade 12 educational settings. Ensure that the programs are physically active, inclusive, safe, and developmentally and culturally appropriate.

Question Asked

"In your course, did students learn about the importance or need for children to have access to and opportunities for high-quality physical education/physical activity programs, in pre-kindergarten through grade 12? (yes/no)

Question Asked

"In your course, did students learn about the importance or need for the programs to be physically active, inclusive, safe, and developmentally and culturally appropriate? (yes/no)

Strategy 2

Develop and implement state and school district policies requiring school accountability for the quality and quantity of physical education and physical activity programs.

Question Asked

"In your course, did students learn about the importance or need for the development and implementation of state and school district policies requiring school accountability for the quality and quantity of physical education and physical activity programs? (yes/no)

Strategy 3

Develop partnerships with other sectors for the purpose of linking youth with physical activity opportunities in schools and communities.

Question Asked

"In your course, did students learn about the importance or need for schools to partner with other sectors for the purpose of linking youth with physical activity opportunities in schools and communities? (yes/no)

Strategy 4

Ensure that early childhood education settings for children ages 0 to 5 years promote and facilitate physical activity.

Question Asked

"In your course, did students learn about the importance or need for early childhood education settings for children ages 0 to 5 years to promote and facilitate physical activity? (yes/no)

Strategy 5

Provide access to and opportunities for physical activity before and after school.

Question Asked

"In your course, did students learn about the importance or need for school-age children to have access to and opportunities for physical activity before and after school? (yes/no)

Strategy 6

Encourage post-secondary institutions to provide access to physical activity opportunities, including physical activity courses, robust club and intramural programs, and adequate physical activity and recreation facilities.

Question Asked

"In your course, did students learn about the importance or need for post-secondary institutions to provide access to physical activity opportunities, including physical activity courses, robust club and intramural programs, and adequate physical activity and recreation facilities? (yes/no)

Strategy 7

Encourage post-secondary institutions to incorporate population-focused physical activity promotion training in a range of disciplinary degree and certificate programs.

Question Asked

"In your course, did students learn about the importance or need for post-secondary institutions to incorporate population-focused physical activity promotion training in a range of disciplinary degree and certificate programs? (yes/no)

Transportation, Land Use and Community Design Sector

Strategy 1

Increase accountability of project planning and selection to ensure infrastructure supporting active transportation and other forms of physical activity.

Question Asked

"In your course, did students learn about the importance or need for the increase accountability of project planning and selection to ensure infrastructure supporting active transportation and other forms of physical activity? (yes/no)

Strategy 2

Prioritize resources and provide incentives to increase active transportation and other physical activity through community design, infrastructure projects, systems, policies, and initiatives.

Question Asked

“In your course, did students learn about the importance or need for prioritizing resources and providing incentives to increase active transportation and other physical activity through community design, infrastructure projects, systems, policies, and initiatives? (yes/no)

Strategy 3

Integrate land-use, transportation, community design and economic development planning with public health planning to increase active transportation and other physical activity.

Question Asked

“In your course, did students learn about the importance or need for integrating land-use, transportation, community design and economic development planning with public health planning to increase active transportation and other physical activity? (yes/no)

Strategy 4

Increase connectivity and accessibility to essential community destinations to increase active transportation and other physical activity.

Question Asked

"In your course, did students learn about the importance or need for increasing connectivity and accessibility to essential community destinations to increase active transportation and other physical activity? (yes/no)

Data Analysis

Proportional estimates for all binary variables were calculated. In the case that more than one faculty member from a university completed the survey, responses were narrowed down to have an overall representative response for each university. If there was at least one "yes" among answers for a question, the university was considered to have a "yes" and calculated as such for data analysis purposes. Relatedly, if, for example, there were 3 participants from a single University, and 1 of them said "yes" to an item with the other 2 saying "no", we considered the University response to be a "yes". A chi-square test was used to determine if there were proportional differences in the evaluated questions across schools ranked 1-35 or 36+ by the National Academy of Kinesiology. Our initial plan was to examine differences across schools ranked above and below the top 10, but this cut point (1-35 vs. 36+) was applied because we had too few respondents ranking in the top 10 and the cut-point of 35 provided more reasonable distribution (see below). School rankings were evaluated from the 2010 Review and Evaluation of Doctoral Programs by the National Academy of Kinesiology[5].Statistical significance was established as $p < 0.05$ using Stata v. 12.

RESULTS

Sixty of the sixty-one institutions were surveyed, excluding the authors' institution. Among the 60 schools who we contacted, 13 institutions were identified and 26 surveys were completed.Among these, 2 did not provide their institution name, and thus the 13 provided institutions were analyzed herein.Among these 13 schools, 5 were ranked in the top 35 (i.e. 1-35, with 8 ranked as 36 or higher. One-hundred percent of the 13 evaluated institutions were aware of the NPAP (Table 1).

The results indicating responses to the NPAP curriculum survey can be found in Table 1. With regard to the Health Care sector, 69% of the evaluated institutions reported incorporating Strategy 1 into their class curriculum, 92% reported incorporating Strategy 2, 46% reported incorporating Strategy 3, 69% reported incorporating Strategy 4, 92% reported incorporating Strategy 5, and 92% also reported incorporating Strategy 6.When evaluated collectively, 100% of the schools reported incorporating at least 1 of the Strategies, with 39% of the institutions incorporating all 6 strategies.

With regard to the Education sector, 2 questions were asked pertaining to Strategy 1. One hundred percent of the evaluated institutions reported incorporating Strategy 1, question 1, while 85% reported incorporating Strategy 1, question 2. Within the same sector, 62% reported

incorporating Strategy 2, 77% reported incorporating Strategy 3, 62% reported incorporating Strategy 4, 77% reported incorporating Strategy 5, 46% reported incorporating Strategy 6, and 54% reported incorporating Strategy 7.When evaluated collectively, 100% of the schools reported incorporating at least 1 of the strategies, with 23% of the institutions incorporating all 7 strategies.

With regard to the Transportation, Land Use and Community Design sector, 77% of the evaluated institutions incorporating Strategy 1, 62% reported incorporating Strategy 2, 70% reported incorporating Strategy 3, and 54% reported incorporating Strategy 4. When evaluated collectively, 85% of the schools reported incorporating at least 1 of the Strategies, with 38% of the institutions incorporating all 4 strategies.

With regard to the chi-square analyses examiningproportional differences across school ranking, these findings can be found in Table 2. Based on all chi-square analyses being non-significant, these findings demonstrated that there was no significant association between knowledge of the NPAP or strategy utilization across school rankings. However, these findings should be interpreted with caution given the low sample size, creating the likelihood of minimal statistical power.

DISCUSSION

The U.S. NPAP promotes physical activity behavior change among 8 societal sectors by its provision of specific evidence-based suggestions for policy and best practices. This study specifically looked at awareness of the NPAP among faculty at theinstitutions offering a doctoral degree in exercise science/physical activity. One-hundred percent of evaluated faculty reported awareness of the NPAP. The utilization of 3 sectors (Health Care, Education, Transportation, Land Use and Community Design) in curriculums among the evaluated institutions was also observed. With regard to the Health Care and Education strategies, 100% included at least one strategy and 85% included at least one Transportation, Land Use, and Community Design strategies. The percentages indicating use of all strategies in each sector was much lower with 39% of institutions reporting use of all Health Care strategies, 23% reported use of all Education strategies, and 38% reporting us of all Transportation, Land Use, and Community Design strategies.Of the 13 evaluated institutions, 5 were ranked in the top 35 according to the 2010 review and evaluation by the National Academy of Kinesiology. This study found no significant association between knowledge/utilization of the NPAP and school ranking.

Previous research has shown that among a sample in Public Health, 79% reported awareness, while approximately 15% utilized the plans at least 6 times in their practice, and identified state-wide promotion of the plan to practitioners as a major area in need of attention.[3]This is worthy of noting as additional research supports an increased effort to promote implementation by SHAPE

(Society of Health and Physical Educators)America, its members, and similar organizations.[6]Implementation difficulty and cost, as well as infrequencies regarding other policies have been found as challenges to the plan regarding the public health sector, with further investigation into understanding and inclusion of the other sector strategies recommended.[7] The results of this study indicate that while a higher percentage of the evaluated institutions incorporated at least 1 of the strategies, when evaluated collectively, less than 40% incorporated all of the strategies from each of the 3 sectors into their curriculum. With previous literature showing a need for better dissemination and implementation explanation, the present study suggests that a lack of thorough incorporation into curriculums may result in inadequate effective implementation among those with direct access to the public. Of course, this is speculative and will need to be assessed in future research.

Given the purpose of the NPAP, along with high awareness among faculty but low implementation, efforts are needed to increase implementation of strategies across various sectors in order to increase the desired outcome. Efforts should include further investigation into why implementation is low and what can be done to promote implementation across relevant sectors. Doctoral students studying exercise behaviors are key components of the NPAP program success, as they are likely to have opportunities to disseminate NPAP goals and strategies to target populations as they enter into their careers. For example, if they enter the world of academia, they will have the opportunity to extend their knowledge of the NPAP to their students. Community design and programmers often have one on one contact with practitioners, and those entering cooperate health have access to several sectors as well.

Strengths of this study include the novel examination of faculty awareness and implementation of the NPAP, and the implications of the results for future investigation on the matter. Limitations of this study include the small sample size due to the low response rate, and only investigating responses regarding just the three sectors evaluated.

In conclusion, these findings demonstrated that while awareness of the NPAP among faculty is high, implementation is much lower. Future research employing a larger proportion of universities will be needed to confirm our null findings between school ranking and implementation of NPAP strategies. If future research using larger sample sizes and inclusion of student surveys confirms low implementation, investigation into barriers to implementing strategies into curriculums as well as possible strategies to overcome these barriers is needed.

APPENDIX

APPENDIX A: RESPONSES TO THE NATIONAL PHYSICAL ACTIVITY PLAN CIRRICULUM SURVEY AMONG 13 UNIVERSITIES REGARDING THE HEALTH CARE, EDUCATION, AND TRANSPORTATION, LAND USE AND COMMUNITY DESIGN SECTORS

Table 1. Responses to the National Physical Activity Plan curriculum survey among 13 Universities regarding the Health Care, Education, and Transportation, Land Use and Community Design Sectors.

	%yes (SE)	%no (SE)
1. Are you aware of the NPAP	100	0
Question "In your course, [course title]"…….	%yes (SE)	%no (SE)
Health Care Sector		
Strategy 1 Did students learn about the importance or need for health care providers to assess and discuss physical activity as a "vital sign" with their patients?	69.23(.13)	30.77(.13)
Strategy 2 Did students learn about the effects that physical activity can have in preventing and treating various chronic diseases?	92.3(.08)	7.69(.08)
Strategy 3 Did students learn ways in which health care professionals can use a health care systems approach to promote physical activity and to prevent and treat physical inactivity?	46.15(.14)	53.85(.14)
Strategy 4 Did students learn ways to help reduce disparities in access to physical activity services in health care	69.23(.13)	30.77(.13)
Strategy 5 Did students learn about the importance or need for physical activity education in the training of all health care professionals?	92.31(.08)	7.69(.08)
Strategy 6 Did students learn about the importance or need for advocating at the local, state, and institutional levels for policies and programs that promote physical activity?	92.31(.08)	7.69(.08)
Education Sector		
Strategy 1: Q-1 Did students learn about the importance or need for children to have access to and opportunities for high-quality physical education/physical activity programs, in pre-kindergarten through grade 12?	100%	
Strategy 1: Q-2 Did students learn about the importance or need for the programs to be physically active, inclusive, safe, and developmentally and culturally appropriate?	84.62(.10)	15.38(.10)
Strategy 2 Did students learn about the importance or need for the development and implementation of state and school district policies requiring school accountability for the quality and quantity of physical education and physical activity programs?	61.54(.14)	38.46(.14)
Strategy 3	76.92(.12)	23.08(.1

Did students learn about the importance or need for schools to partner with other sectors for the purpose of linking youth with physical activity opportunities in schools and communities?		2)
Strategy 4 Did students learn about the importance or need for early childhood education settings for children ages 0 to 5 years to promote and facilitate physical activity?	61.54(.14)	38.46(.14)
Strategy 5 Did students learn about the importance or need for school-age children to have access to and opportunities for physical activity before and after school?	76.92(.12)	23.08(.12)
Strategy 6 Did students learn about the importance or need for post-secondary institutions to provide access to physical activity opportunities, including physical activity courses, robust club and intramural programs, and adequate physical activity and recreation facilities?	46.15(.14)	53.85(.14)
Strategy 7 Did students learn about the importance or need for post-secondary institutions to incorporate population-focused physical activity promotion training in a range of disciplinary degree and certificate programs?	53.85(.14)	46.15(.14)
Transportation, Land Use and Community Design Sector		
Strategy 1 Did students learn about the importance or need for the increase accountability of project planning and selection to ensure infrastructure supporting active transportation and other forms of physical activity?	76.92(.12)	23.08(.12)
Strategy 2 Did students learn about the importance or need for prioritizing resources and providing incentives to increase active transportation and other physical activity through community design, infrastructure projects, systems, policies, and initiatives?	61.54(.14)	38.46(.14)
Strategy 3 Did students learn about the importance or need for integrating land-use, transportation, community design and economic development planning with public health planning to increase active transportation and other physical activity?	69.23(.13)	30.77(.13)
Strategy 4 Did students learn about the importance or need for increasing connectivity and accessibility to essential community destinations to increase active transportation and other physical activity?	53.85(.14)	46.15(.14)

APPENDIX B: Association between knowledge and utilization of the National Physical Activity Plan and school rankings according to the 2010 Review and Evaluation of Doctoral Programs by the National Academy of Kinesiology

Table 2.Association between knowledge and utilization of the National Physical Activity Plan and school rankings according to the 2010 Review and Evaluation of Doctoral Programs by the National Academy of Kinesiology

	Ranking					
	1-35		36+			
	Yes (N)	No (N)	Yes (N)	No (N)	χ^2	P-Value
Health Care Sector						
Strategy 1 Did students learn about the importance or need for health care providers to assess and discuss physical activity as a "vital sign" with their patients?	4	1	5	3	0.44	0.50
Strategy 2 Did students learn about the effects that physical activity can have in preventing and treating various chronic diseases?	4	1	8	0	.68	.41
Strategy 3 Did students learn ways in which health care professionals can use a health care systems approach to promote physical activity and to prevent and treat physical inactivity?	2	3	4	4	.12	.73
Strategy 4 Did students learn ways to help reduce disparities in access to physical activity services in health care	4	1	5	3	.44	.51
Strategy 5 Did students learn about the importance or need for physical activity education in the training of all health care professionals?	5	0	7	1	.68	.41
Strategy 6 Did students learn about the importance or need for advocating at the local, state, and institutional levels for policies and programs that promote physical activity?	5	0	7	1	.68	.41
Education Sector						
Strategy 1: Q-1 Did students learn about the importance or need for children to have access to and opportunities for high-quality physical education/physical activity programs, in pre-kindergarten through grade 12?	5	0	8	0	-	-
Strategy 1: Q-2 Did students learn about the importance or need for the programs to be physically active,	5	0	6	2	-	-

inclusive, safe, and developmentally and culturally appropriate?						
Strategy 2 Did students learn about the importance or need for the development and implementation of state and school district policies requiring school accountability for the quality and quantity of physical education and physical activity programs?	2	3	6	2	1.59	.21
Strategy 3 Did students learn about the importance or need for schools to partner with other sectors for the purpose of linking youth with physical activity opportunities in schools and communities?	4	1	6	2	.04	.84
Strategy 4 Did students learn about the importance or need for early childhood education settings for children ages 0 to 5 years to promote and facilitate physical activity?	2	3	6	2	1.59	.21
Strategy 5 Did students learn about the importance or need for school-age children to have access to and opportunities for physical activity before and after school?	3	2	7	1	1.31	.25
Strategy 6 Did students learn about the importance or need for post-secondary institutions to provide access to physical activity opportunities, including physical activity courses, robust club and intramural programs, and adequate physical activity and recreation facilities?	2	2	4	5	.12	.73
Strategy 7 Did students learn about the importance or need for post-secondary institutions to incorporate population-focused physical activity promotion training in a range of disciplinary degree and certificate programs?	3	2	4	4	.12	.73
Transportation, Land Use and Community Design Sector						
Strategy 1 Did students learn about the importance or need for the increase accountability of project planning and selection to ensure infrastructure supporting active transportation and other forms of physical activity?	4	1	6	2	.04	.84
Strategy 2 Did students learn about the importance or need	4	1	4	4	1.17	.28

for prioritizing resources and providing incentives to increase active transportation and other physical activity through community design, infrastructure projects, systems, policies, and initiatives?						
Strategy 3 Did students learn about the importance or need for integrating land-use, transportation, community design and economic development planning with public health planning to increase active transportation and other physical activity?	4	1	5	3	.44	.51
Strategy 4 Did students learn about the importance or need for increasing connectivity and accessibility to essential community destinations to increase active transportation and other physical activity?	4	1	3	5	2.24	.14

(-) Chi-square and p-values were not calculable among variables that had a zero response.

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Conclusion of Two Studies

Both studies show evidence of low implementation of the two evaluated physical activity initiatives. Regarding EiM, among the three evaluated subpopulations, awareness of the initiative was under 26%. This is a great indicator of low implementation for this geographically defined population. Proper physical activity education and training provided to clinicians may result in an increased awareness, therefore presenting possible implications of increased implementation into clinical practice. This study also showed significant misguided perceptions of the medicine and the initiative. Less than 35% of the three populations perceived the term medicine to have treatment and preventative effects and less than

45% perceived the initiative to have preventative and treatment aspects. The results of the second study showed that while 100% of faculty were aware of the NPAP, less than 40% of the evaluated institutions were in fact incorporating all of the strategies from the 3 included societal sectors; Health Care, Education, and Transportation, Land Use and Community Design. This may present an implication offering explanation of low physical activity assessment in a clinical setting shown in Study 1. If individuals studying to enter a career involving influence of physical activity behaviors are not provided proper education and training on effective implementation of evidenced-based practices, they may enter the workforce with inadequate skills to properly fulfill their job requirements.With the research strongly supporting the many health benefits of physical activity, it is crucial that already developed policies and initiatives are properly implemented into practice. Both studies indicate missed opportunities for educating and training those professionals who will have direct access to general patient populations. Physical activity assessment is as an important part of medicinal practice as any. As of yet, very few medical and exercise science programs are offering students,

and those in the healthcare profession, adequate educational opportunities to learn how to assess and prescribe physical activity. This is a problem, as research continues to strongly support the significance of physical activity participation and it's linearity to an individual's health status. The two studies discussed in this thesis bring to light opportunities to further investigate barriers to the implementation of the NPAP and EiM initiative, as well as further research into successful implementation of strategies among the education and public health fields.

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PEER REVIEWED PUBLICATIONS

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