

Physical Activity Counseling Knowledge, Attitudes, and Practices Among
Nurse Practitioners and Physician Assistants

by

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ABSTRACT

Health care providers (HCPs) are an important source of physical activity (PA) information. Two studies were conducted to qualitatively and quantitatively examine nurse practitioners'(NPs) and physician assistants' current PA counseling practices, knowledge and confidence to provide PA counseling and providers' perceptions about their current PA counseling practices. The specific aims for these two studies included quantitatively and qualitatively identifying the prevalence of PA counseling, perceived counseling knowledge and confidence, and educational training related to counseling. In study 1, survey respondents were currently practicing NPs and physician assistants. Participants completed a modified version of the Promotion of Physical Activity by Nurse Practitioners Questionnaire either online or in person during a population specific conference. The majority of both NP and physician assistant respondents reported routinely counseling patients about PA. There were no differences in perceived knowledge or confidence to provide PA counseling between the two populations. Approximately half of all respondents reported receiving training to provide PA counseling as part of their educational preparation for becoming a health practitioner. Nearly three-quarters of respondents reported interest in receiving additional PA counseling training. In study 2, five focus groups (FGs), stratified by practice type, were conducted with NPs and physician assistants. Both NPs and physician assistants reported discussing PA with their patients, particularly those with chronic illness. Participants reported that discussing lifestyle modifications with patients was the most common type of PA counseling provided. Increased

confidence to counsel was associated with having PA knowledge and providing simple counseling, such as lifestyle modifications. Barriers to counseling included having more important things to discuss, lack of time during appointments, the current healthcare system, lack of reimbursement and perceived patient financial barriers. PA recommendation knowledge was highly variable, with few participants reporting specific guidelines. FG participants, while not familiar with the American College of Sports Medicines' "Exercise is Medicine" initiative indicated interest in its use and learning more about it. The findings of these two studies indicate that while NPs and physician assistants are knowledgeable, confident and currently providing some amount of PA counseling to patients, additional training in PA counseling is needed and desired.

DEDICATION

For my husband, Brian
and my parents, Rolf and Kathleen

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Chapter 1

INTRODUCTION

Problems to be Investigated

Leading a physically active lifestyle contributes to decreased risk for obesity, cardiovascular disease, hypertension, diabetes, and premature mortality (U. S. Department of Health and Human Services [USDHHS], 1996). However, only 47% of the adult U.S. population meets the minimum recommended levels of physical activity (PA) (Centers for Disease Control and Prevention [CDC], 2007). Research suggests that PA counseling by primary care providers (PCPs) is a viable method of increasing PA behavior of their patients (Calfas, Long, Sallis, Wooten, Pratt, & Patrick, 1996; Grandes et al., 2009; Lawlor & Hanratty, 2001; Lewis & Lynch, 1993; Pinto, Goldstein, DePue, & Milan, 1998). One of the Healthy People 2020 objectives is to increase the proportion of health care office visits for chronic diseases or conditions that include counseling or education related to exercise (USDHHS, 2009). Furthermore, the American College of Sports Medicine (ACSM) endorses an initiative entitled “Exercise is Medicine” that calls for making PA assessment and prescription a standard part of disease prevention and treatment (Sallis, 2009). Components of this initiative include: creating awareness that exercise is medicine, helping physicians and healthcare providers become effective in counseling and referring patients for increased PA, generating policy changes to support PA counseling and referrals, creating an expectation among patients and their healthcare providers to have a dialogue

regarding PA, and encouraging physicians and healthcare providers to be more physically active (Jonas & Phillips, 2009).

Medical professionals are a respected source of information and it has been reported that approximately 80% of U.S. adults visit their PCP at least once a year (Tulloch, Fortier, & Hogg, 2006). As fewer medical school graduates choose primary care as their specialty, NPs and physician assistants' are being utilized more frequently as PCPs (Buchholz & Purath, 2007; Everett, Schumacher, Wright, & Smith, 2009; Hooker, 2006). NPs are advanced practice nurses who provide healthcare services similar to those of a doctor including diagnosis and treatment of diseases/conditions, prescription of medications and overall patient care (American Academy of Nurse Practitioners [AANP], n.d.). One distinguishing characteristic of NP provided care is a focus on prevention and wellness (AANP, n.d.). Entry level training for NPs is a graduate degree through an accredited NP program (masters or doctoral level) followed by successful completion of a national board examination (AANP, n.d.; Arizona Nurse Practitioners Council, n.d.). Every five years, NPs must accumulate 75 contact hours and 1000 hours of clinical practice or sit for a recertification exam (AANP, n. d.). In 2007, there were an estimated 147,295 registered NPs in the U.S. (Pearson, 2009). Approximately 85% of NPs work in primary care (Everett et al., 2009; Hooker, 2006). According to the Arizona State Board of Nursing in 2011, there were approximately 3,555 NPs in Arizona.

Physician assistants are health care professionals licensed to practice medicine under the supervision of a physician (Arizona State Association of

Physician Assistants, n.d.). Their scope of practice varies by training, experience and state regulations. Physician assistant training consists of completing a program (average length of approximately 26 months) that is based on the medical model and followed by the successful completion of a national certification examination (American Academy of Physician Assistants [AAPA], 2008). Every two years, physician assistants must log 100 hours of continuing medical education and complete a recertification exam every six years (AAPA, 2008). In 2008, an estimated 74,000 physician assistants worked in clinical care practice in the U. S. (AAPA, 2008). In 2010 there were approximately 1,662 practicing physician assistants in Arizona (Kaiser Family StateHealthFacts.org, 2010). It has been reported that approximately 50% of physician assistants work in primary care (Everett et al., 2009).

As non-physician clinicians, such as NPs and physician assistants, become more prevalent as PCPs, it is important to understand their knowledge and practices regarding PA counseling. It has been reported that approximately 30% of NPs question their patients about PA participation yet only 14% provide any PA counseling (Burns, Camaione, & Chatterton, 2000). The percentage of physician assistants that assess their patients PA participation or provide counseling has not been published in the literature to date.

Purpose of Studies

The purpose of these studies was to examine the knowledge of, attitudes toward, confidence in, and PA counseling practices of NPs and physician assistants. Study I was a quantitative survey of employed NPs and physician

assistants examining whether differences existed between samples of these two populations regarding prevalence of, knowledge and confidence in PA counseling, and educational training related to PA counseling.

Study II was qualitative in nature, consisting of five focus groups (FGs), three with NPs and two with physician assistants. This study qualitatively examined NPs' and physician assistants' beliefs about their knowledge of and training for physical activity counseling. Qualitative research is an appropriate method of inquiry to use when there is limited information about an area. It is not restricted in terms of questions, nor limited by statistical interpretation (Strauss & Corbin, 1990). Rather, this type of data can lead to insight that may not be found through quantitative methods. Specifically, we investigated perceived confidence in and current PA counseling practices, PA knowledge, sources of PA knowledge, perceived need for additional information about PA, and desired methods of information delivery among NPs and physician assistants. We also explored familiarity with the "Exercise is Medicine" initiative that calls for HCPs to assess and counsel patients for PA at every visit (Sallis, 2009). Finally, we compared our findings from our NP FGs to findings from our physician assistant FGs to determine similarities and differences between these populations on these issues.

Significance of Studies

As previously stated, approximately half of U.S. adults do not meet the minimum recommended levels of PA (CDC, 2007). Regular participation in PA is an important factor in the prevention and management of chronic disease (USDHHS, 1996). One research study proposed that if all U.S. adults exercised

for 30 minutes daily, it could save the U.S. health care system up to \$76 billion dollars annually (Pratt, Macera, & Wang, 2000). Previous primary care PA interventions have had mixed results; however, successful interventions that increase PA in even a small percentage of sedentary patients may produce a large number of individuals that experience health benefits associated with beginning and maintaining regular PA (Pinto, Goldstein, & Marcus, 1998).

FGs with NPs and physician assistants provided beneficial information regarding current PA knowledge, where information about PA is obtained, the type of PA information desired by this population, and possible methods for disseminating such information. While some previous qualitative research regarding PA counseling has been performed with NPs specific to PA promotion in the geriatric population (Melillo, Houde, Williamson & Futrell, 2000), this type of information from the physician assistant population is noticeably absent. Additionally, the survey study yielded answers to the same questions from both the NP and physician assistant populations allowing for comparisons between these two groups of care providers. Only three previous quantitative studies have attempted to examine the knowledge of, confidence in and PA counseling practices of NPs (Buchholz & Purath, 2007; Burns, Camaione, & Chatterton, 2000; Tompkins, Belza, & Brown, 2009). The information obtained as a result of the current study will fill gaps in the literature including identifying NP and physician familiarity with the “Exercise is Medicine initiative (Sallis, 2009), identification of the perceived need for and/or interest in training related to PA counseling in NPs and physician assistants, determination of self-reported

knowledge and confidence in PA counseling and educational background related to PA counseling in physician assistants and the comparison of this information between NPs and physician assistants. This information is also critical as a potential foundation for future interventions utilizing NPs and physician assistants as PA counselors.

Study I Research Objectives

Research objectives for the quantitative survey included:

1. Examining similarities and differences in the prevalence of PA counseling practices among NPs and physician assistants participating in a cross-sectional study.
2. Determining similarities and differences in self-perceived knowledge of NPs and physician assistants participating in a cross-sectional study to counsel PA.
3. Determining similarities and differences in self-perceived confidence in ability of NPs and physician assistants participating in a cross-sectional study to counsel PA.
4. Examining similarities and differences regarding educational training related to PA counseling between NPs and physician assistants participating in a cross-sectional study.

Study I Research Hypotheses

1. There will be no significant differences in the prevalence of PA counseling practices among NPs and physician assistants participating in a cross-sectional study.

2. There will be no significant differences between NPS and physician assistants participating in a cross-sectional study in self-perceived knowledge to counsel PA.
3. There will be no significant differences between NPs and physician assistants participating in a cross-sectional study in confidence to counsel PA.
4. There will be no significant differences in the educational training related to PA counseling between NPs and physician assistants participating in a cross-sectional study.

Study II Research Objectives

Research objectives for the qualitative FGs included:

1. A qualitative exploration of NPs' and physician assistants' current PA counseling practices.
2. A qualitative investigation of NPs' and physician assistants' confidence in providing PA counseling.
3. A qualitative exploration of NPs' and physician assistants' current knowledge of PA and sources of PA knowledge.
4. A qualitative examination of NPs' and physician assistants' familiarity with and interest in the "Exercise is Medicine" initiative (Sallis, 2009).
5. A qualitative exploration of the types of information that would aid NPs and physician assistants in PA counseling and how best this information would be delivered.

For each of these objectives, a comparison of the similarities and differences between NPs and physician assistants will be performed.

Chapter 2

REVIEW OF LITERATURE

Background and Need for Primary Care Interventions

Several well known benefits of PA include reducing risk of obesity, hypertension, diabetes, osteoporosis, stroke, peripheral vascular disease, and improving in body fat distribution (Blair, Kohl, Gordon, & Paffenbarger, 1992; USDHHS, 1996). The most recent PA guidelines for Americans recommend obtaining at least 150 minutes of moderate intensity PA per week or 75 minutes of vigorous intensity PA per week or any combination of the two for substantial health benefits (USDHHS, 2008). For additional health benefits, adults should increase this to 300 minutes of moderate or 150 minutes of vigorous intensity activity. Furthermore, muscle strengthening activities should be completed at moderate or high intensity and involve all major muscle groups on two or more days per week (USDHHS, 2008). However, less than half of U.S. adults meet current recommendations (CDC, 2007). Research suggests that the majority of adults expect advice from the healthcare system regarding diet and exercise (Tulloch et al., 2006; Whitlock, Orleans, Pender & Allan, 2002). Some research suggests that PCPS are interested in providing PA advice, writing exercise prescriptions and recognize the importance of primary care PA promotion (Garry, Diamond, & Whitley, 2002; Jacobson, Strohecker, Compton, & Katz, 2005). Further, there is evidence of an association between clinician advice with and increased satisfaction with medical care (Whitlock et al., 2002). The 2002 National Ambulatory Medical Care Survey reported 316 physician office visits

per 100 persons (age adjusted) with approximately half occurring in primary care specialties (Jacobson et al., 2005). Data such as this suggest that the impact PA counseling in primary care could have at a population level is tremendous. Pinto, Goldstein, and Marcus (1998) describe the interaction between the high prevalence of sedentary behavior and the frequency of physician visits, coupled with primary care PA promotion as having the potential to significantly impact the incidence of hypokinetic diseases such as heart disease, stroke, hypertension.

In 2005, the American College of Preventive Medicine issued a position statement “that primary care providers should incorporate PA counseling into routine patient visits” (Jacobson et al., 2005). Several other professional organizations echo this sentiment including the American Academy of Family Physicians, the American Academy of Pediatrics, the American College of Obstetrics and Gynecology, the American Heart Association, National Institutes of Health, and the Surgeon General (Garry et al., 2002; Jacobson et al., 2005). The ACSM is yet another organization that recognizes and endorses the importance of primary care PA counseling through its initiative, “Exercise is Medicine” (Sallis, 2009). This initiative seeks to create awareness that “exercise is medicine” and should be prescribed accordingly (Sallis, 2009).

To determine the issues related to implementing PA counseling in primary care, several questionnaire or survey based data have been gathered from primary care providers (see Table 1). Examples of such issues include providers’ attitudes toward, perceived barriers to, and current PA counseling practices. Bull, Schipper, Jamrozik, and Blanksby (1995) distributed a questionnaire to 1,228 general

practitioners in Perth, Australia to assess the current practice, perceived practice and barriers related to PA promotion in general practice. Results indicated that the majority of the respondents most frequently discussed exercise with patients who possessed symptoms of conditions that would benefit from exercise, rather than all patients. Walking was the most commonly suggested type of PA. The most common barriers to PA counseling include lack of time (29%) and insufficient educational materials (29%).

Other studies have reported similar results. Sherman and Hershman (1993) conducted a study to assess how often physicians counsel patients about exercise and to identify if differences exist between internists who counsel and those who do not. A total of 422 questionnaires were returned, of which 75% of respondents were male and the median age was 41. Approximately 33% of respondents reported that they counsel more than 75% of their patients, while 17% reported that they counsel less than 25% of their patients. Respondents who felt that exercise was very important to health were more likely to counsel. Similarly, it was found that physicians with lower resting heart rates (a marker of cardiorespiratory fitness) were more likely to counsel. Approximately 33% of respondents identified a need for more practice with exercise counseling skills as a barrier to counseling about exercise. These authors suggest that more training in counseling techniques are needed among PCPs (Sherman and Hershman, 1993).

Walsh, Swangard, Davis, and McPhee (1999) surveyed physicians (n=175; 54% response rate) using a modified version of the previous questionnaire by Sherman and Hershman (1993). Approximately 65% of

participants reported engaging in regular exercise for an average of 3.6 times per week. Almost 75% of physicians felt that they had an adequate amount of knowledge to prescribe exercise to a healthy adult, although only 12% were familiar with the ACSM recommendations. Approximately 63% of respondent physicians felt somewhat comfortable with exercise counseling and 12% of respondents felt they needed more practice with effective counseling skills. Finally, while 75% felt that exercise counseling was very important for both a 55 year old, and a 75 year old with coronary heart disease, only 63% felt that exercise counseling was important for a healthy 35 year old.

Similarly, a survey inquiring about knowledge, attitudes, and self-reported practice regarding PA promotion in primary care in the UK was obtained from 174 general practitioners (GPs) (Lawlor, Keen, & Neal, 1999). Nearly 75% of respondents believed that any level of PA was beneficial for health, and that they had sufficient knowledge to give advice to patients about PA. GPs were more likely to provide PA advice when it was linked to a patient's presenting problem and felt that this was a more effective approach to PA promotion in primary care. The most common conditions for which GPs provided PA advice were being overweight and having risk factors for ischaemic heart disease. Only 8% indicated they would give PA advice to all patients. The results of this study are in line with similar surveys that suggest that PA promotion in primary care is not enough to make population level changes (Lawlor et al., 1999).

Some research suggests that the personal exercise habits of primary care physicians influence their counseling practices. A cross-sectional survey study by

Abramson, Stein, Schauffele, Frates, and Rogan (2000) of 298 physicians (33% female; average age=50 years) included 84 family practitioners, 79 pediatricians, 58 geriatricians and 77 internists. Physicians who regularly performed aerobic exercise were more likely to counsel their patients about aerobic exercise (OR 5.72; 95% CI 2.41-13.54; $p=0.032$). Similarly those who regularly performed strength training were more likely to counsel on strength training (OR 4.55; 95% CI 2.61-7.91; $p<0.0005$). Common barriers to counseling were similar to other reports and included inadequate time and inadequate knowledge or experience. Of those providing counseling, 83% spent less than five minutes counseling patients. All respondents who reported counseling reported using verbal counseling, although several used more than one counseling strategy. Approximately 34% and 47% of physicians referred their patients to a physical therapist or an athletic trainer for aerobic and strength training, respectively. Written materials or the use of demonstration during counseling were less used than previously mentioned counseling strategies.

A more recent study of medical students suggests that PA habits are maintained during medical school and are correlated with intention to counsel in practice (Frank, Tong, Lobelo, Carrera, and Duperly, 2008). A representative sample of 1469 class of 2003 medical students attending one of sixteen U.S. medical schools completed questionnaires at freshman orientation, orientation to hospital wards, and during their senior year. PA levels appeared stable over time with more than half the sample (61%) meeting CDC recommendations. Those reporting the lowest rates of PA included African-American students and those

intending to specialize in primary care. Those with the highest rates of PA included Hispanic students, those intending to sub-specialize, and students who felt positive about their schools' and classmates attitudes toward PA promotion. Perceived relevance of exercise counseling was higher at orientation to hospital wards than at senior year (69% vs. 53%, $p < 0.01$). The authors suggest that this decrease may be due to increased time spent working with clinicians during the final years of medical school who may not regard PA counseling as important.

van der Ploeg et al. (2007) conducted a questionnaire study examining the changes in knowledge, confidence, role perception, and PA counseling practices of GPs between 1997 and 2000. Results indicated that there were significant improvements in all knowledge of PA recommendations and confidence regarding counseling. In 2000, almost all GPs recognized their role in helping patients increase PA; however, there were no increases in the number of patients with whom GPs counseled about PA.

Effectiveness of Primary Care Interventions

Primary care PA interventions have been conducted over the past two decades with mixed results (see Tables 2 & 3). Several of these studies have methodological issues that need to be considered when interpreting their results. Non-randomization, poor follow-up, varying definitions of active and sedentary behavior, inconsistent primary outcomes, and minimal long-term assessment are a few of these issues (Jacobson et al., 2005). Previous successful primary care interventions focused primarily on PA as opposed to several behaviors at once

(e.g. smoking, alcohol use) and included a theoretical foundation, primarily the Transtheoretical Models' stage of readiness for change (Jacobson et al., 2005).

Quasi-experimental Primary Care Interventions

A non-randomized study by Logsdon, Lazaro, and Meier (1989) compared usual care to age specific intervention protocols based upon multiple individualized behavioral risks (lack of exercise, high blood pressure, excessive dietary fat, overweight, seat belt use, and alcohol misuse) as determined through survey responses. Potential participants were patients who had seen their PCP in the past two years and responded to a mailed survey. After questionnaire completion, patients made appointments to see their PCP for a free preventive care visit. Follow-up surveys were collected 10-12 months later. Intervention participants who attended the free PCP appointment (n=140) were more likely to begin exercising regularly at 12-months follow-up compared to participants at the control sites (n=83) (p=0.02; OR 1.65; 95% CI 1.12-2.43). There was a potential for bias in this study's results due to self-selection of those attending the appointment or not. Those in this group may have had increased motivation for change.

Another non-randomized study, whose results could be biased was conducted by Lewis & Lynch (1993). This study utilized two to three minutes of verbal advice to patients (n=396, aged 18 and above). Baseline testing took place over a two-month period and consisted of assessment of patient exercise patterns and physician provision of PA advice. Immediately following this and prior to the start of the intervention, twelve intervention physicians were trained for

approximately 15 minutes using a pocket-sized card outlining the research protocol and supporting rationale for the study. The intervention protocol consisted of three steps: asking about exercise, assessing patient response, and advising accordingly. If patients were expending less than 500 kilocalories a week (equivalent to approximately two hours of moderate walking), they were advised to initiate or increase moderate PA. Patients were excluded from intervention if they were expending greater than 500 kilocalories of energy a week, appeared to be a poor candidate for exercise advice or if the physician was too busy and chose to omit. A follow-up phone call was made to intervention participants approximately one month later. Detailed information regarding the purpose of these calls was not reported. After six-weeks, minutes of activity per week increased for intervention participants (+108.7 minutes) compared to control participants (-23.7 minutes; $p=0.01$). Number of exercise episodes per week was not significantly different (0.7 intervention vs. 0.4; $p=0.37$). This study suggests that a simple, short intervention can increase number of minutes of exercise per week in patients. However, it is important to note that the doctors ability to choose whether to provide PA counseling presents a threat to the validity of these results (Lawlor & Hanratty, 2001).

Marcus et al. (1997) conducted a small quasi-experimental PA counseling trial aimed at older adults. A convenience sample of four internal medicine residents and their staff were trained to deliver a 3 to 5 minute counseling session with patients using the “5 As” (1. asking about activity, 2. assessing present activity level, 3. advising about activity, 4. assisting the patient to increase

activity, and 5. arranging for follow-up) and the Transtheoretical Model readiness for behavior change. The intervention consisted of a physician message, written educational and behavior change materials matched to patient's stage of change. Six-week follow-up found that both control (n=25) and intervention participants (n=19) increased PA levels from baseline with no significant differences (p=0.19). Participants who reported receiving advice about PA, a written PA prescription, additional written materials on PA (stage-matched PA booklet for behavior change) and a follow-up visit specific to PA had significantly higher Physical Activity Scale for the Elderly (PASE) scores than control participants (p=0.05). It is important to note that only 67% of intervention participants reported receiving a PA prescription, while 32% of control participants reported that their doctor spoke with them about PA, which may affect data interpretation.

Additional quasi-experimental studies have utilized supplementary intervention components beyond verbal advice (e.g. pamphlets, handouts, mailings) (Bull & Jamrozik, 1999; Calfas et al., 1996; Kelly, 1998; Smith, Bauman, Bull, Booth, and Harris, 2000). Kelly (1988) conducted a 6-week general health promotion intervention in one family practice residency program. Patients filled out a five to seven minute questionnaire assessing lifestyle behavior (e.g. nutrition, seat belt use, exercise, stress, alcohol intake and smoking) while waiting to see a physician for a regularly scheduled appointment. Prior to completing the questionnaire, participants were randomly divided into three groups. Participants in group one (all program components) received scores based upon questionnaire responses for each lifestyle behavior and this information was

provided to the physician who then provided verbal instruction and materials (pamphlets) relevant to the specific lifestyles behaviors that indicated risk for each individual. Group two (control for effect of physician lifestyle prescription) participants received instructional materials for all lifestyle areas, regardless of questionnaire responses, from a nurse and did not receive any lifestyle instruction from the physician. Group three (control) completed the initial questionnaire but did not receive physician intervention or materials. Group four (control for all participation effect) did not participate in the study beyond provision of age and demographic information. After four weeks, participants had a follow-up phone interview to determine changes made since their physician appointment.

Approximately half of all participants, when combining all groups, made some type of behavior change. Analyses revealed that participants receiving at least one intervention component reported more behavior change than those receiving no intervention ($p=0.001$). Group one was the most effective group in terms of behavior change. There was no advantage to receiving written information without the physician message (group two) over behavior assessment alone (group three).

Bull & Jamrozik (1999) examined the effect of receiving verbal advice and a standard ($n=193$) or tailored pamphlet ($n=223$) on exercise from a family physician compared to a control group ($n=347$). Sedentary patients ($n=763$) were allocated to study group based upon the day of the week of the initial consultation. Patients were excluded if GPs lacked time or considered the intervention inappropriate for patient, suggesting possible selection bias (Tulloch

et al., 2006). The verbal advice provided during the intervention lasted approximately two to three minutes and addressed the importance of PA, recommendations for moderate exercise, and concerns about current or potential injuries related to exercise (Bull & Jamrozik, 1999). The tailored pamphlets were based upon the benefits of and barriers to PA identified by the individual patient. The standard pamphlets were similar to the tailored pamphlets in their layout, text and graphics. Within 2 days of the initial appointment and verbal advice, the standard or tailored pamphlet was sent to each patient's home. Measures were obtained through mailed questionnaires at 1-, 6-, and 12-months after the initial visit and included three questions assessing vigorous, moderate and walking exercise over the past 2-weeks, stage of readiness to change, preferred type of exercise and barriers to exercise. There were significant differences in those reporting current PA at 1-month ($p < 0.01$) and 6-months ($p < 0.02$) in favor of receiving exercise advice (all intervention participants) compared to control group participants. There were no significant differences at 12-months follow-up. Analyses revealed no significant increase in readiness to exercise between the two intervention groups at 6- or 12-months. This suggests that tailored PA pamphlets do not provide any additional effect in increasing short-term PA participation among those receiving a verbal recommendation in primary care.

Similarly, Smith and colleagues (2000) investigated the effect of a written prescription for PA alone versus the prescription with supplemental mailings in routine care patients in a non-randomized study. The trial was conducted in 27 Australian general practices with control participants recruited prior to the start of

the intervention. Prior to start of intervention, GPs received a 20-30 minute training session and although blinded to participant baseline measures, “were encouraged to provide a prescription that they considered appropriate” (Smith et al., 2000). Half of intervention participants received one of four mailed booklets (tailored to a particular stage of change as determined through baseline measures) and the other half of intervention participants did not. Follow-up measures (2-week PAR and stage of readiness for PA) were obtained over the telephone at 6-10 weeks and 7-8 months. GP records indicated that prescription was provided to 88.5% of intervention subjects. The most common reason for lack of prescription was that they were sufficiently active already. Analyses revealed that increased PA was greater in the two intervention groups compared to control. However, prescription plus receipt of booklet was associated with greater improvement in self-reported PA than prescription alone. Unlike Bull and Jamrozik’s (1999) findings that that tailored PA pamphlets did not provide additional effect for PA promotion, Smith and colleagues found that four mailed information booklets were helpful in increasing PA. However, similarly to Bull and Jamrozik (1999), only short term benefits were found. By 7-8 months, PA had decreased for all participants (Smith et al., 2000).

One of the more complex quasi-experimental studies is the Physician-based Assessment and Counseling and for Exercise (PACE) program (Calfas et al., 1996). This efficacy trial utilized 22 physicians (n=10 control, n=12 intervention) in one county who had a self-reported interest in PA counseling. Participants were sedentary patients (n=114 control; n=98 intervention) that were

scheduled for an office visit during the first three to six weeks of the study. Participants completed a PACE assessment that determined stage of change while waiting to see the physician. Staff at the clinic scored the assessment and gave intervention participants a protocol targeting perceptions of barriers, social support, belief about personal benefits and self-efficacy tailored to his or her stage of change (e.g. pre-contemplation, contemplation, and active) (Patrick et al., 1994). The physician would discuss the protocol with the patient for 3-5 minutes and make recommendations during the appointment. A 10-minute booster call was made to intervention participants to answer questions and discuss progress with a member of the research staff. Study measures were obtained at baseline and follow-up (4-6 weeks later) and included the PACE assessment, questions about walking from the College Alumni Study and the National Health Interview Survey (NHIS), and the 7-day Physical Activity Recall (PAR). A subsample of participants (n=22 control; n=34 intervention) also wore Caltrac accelerometers for 3 days at baseline and follow-up. Finally, a chart audit was conducted to determine documentation of intervention delivery. Since the majority of participants were in the contemplation stage of change, analyses were performed for this stage specifically. These revealed significant positive differences in PACE assessment score ($p<0.005$), walking for exercise (from both NHIS, $p<0.05$; College Alumni Study questionnaire, $p<0.05$), total walking score (College Alumni Study questionnaire, $p<0.025$) and the accelerometer data ($p<0.005$). Differences between intervention and control for the 7-day PAR was not significant ($p<0.08$). Limitations include lack of evaluation of stages other than

contemplation, short follow-up period, and physician self-selection. The authors also suggest that future studies be performed to examine the efficacy of health educators and nurses as PA counselors.

A feasibility study of the PACE intervention was conducted by Long et al. (1996) in a multisite trial. Similar to Calfas and colleagues (1996), PCPs interested in PA counseling (n=27) were recruited to participate in the five-month intervention as well as four staff persons, one to act as office coordinator at each site. Office staff (non-randomly) recruited 5-10 “apparently healthy” patients per week to participate in the intervention. Perceptions of the feasibility of the intervention were obtained from providers, office staff and participants. While the majority of providers were already asking about and recommending PA to patients, they were more likely to recommend other types of preventive medicine over PA. Average PA knowledge increased post training; however, approximately 75% of providers were still unable to identify the ACSM minimum activity intensity requirements for increasing cardiorespiratory fitness (i.e. 60-90% of maximal heart rate) and approximately 60% were unable to identify whether a stress test was required or not when recommending moderate intensity PA (Long et al., 1996). Office staff reported that the PACE program implementation went well or very well, although only one-third of providers reported that their office staff had minimal difficulty adopting the program. Participating patients (n=107) were interviewed two to four weeks after receiving PACE counseling for feedback. Approximately two-thirds of participants kept the provided materials, but only 10% kept it in a location where they would see it regularly. Nearly 40%

of participants lost, threw away, or could not remember what they did with materials. Half of the precontemplator participants reported considering beginning a PA program after PACE counseling. Nearly 66% of contemplators reported making the provider recommended change in activity after counseling and 90% of active participants continued their current level of PA. This study found that the PACE intervention was effective and feasible for use in this setting.

Randomized Primary Care Interventions

In addition to the several quasi-experimental trials for PA counseling in primary care, there have been numerous randomized trials of varying success. A cluster-randomized controlled trial was conducted with Australian GPs (Graham-Clarke & Oldenburg, 1994). The Fresh Start program is a multiple risk factor intervention that is based on the Transtheoretical Model comprised of three subprograms (smoking cessation program, healthy eating, and PA) that can be used alone or in combination depending upon a patients' risk profile. Eighty GPs were randomly allocated to one of three conditions, routine care (control), lifestyle counseling using video, and lifestyle counseling using video plus self-instructional materials. GPs randomized to one of the intervention groups were asked to conduct a risk factor assessment on all patients and to offer the Fresh Start program to those eligible (n=758; 18-69 y old, one or two modifiable risk factors for cardiovascular disease [CVD], and no chronic, debilitating disease). The program consisted of stage of change (preparation, action, and maintenance) specific strategies, but no clear information was provided regarding details of the intervention. Data (self-reported PA and stage of change) measured at 4-6 months

and 12-18 months revealed no significant differences between groups and no clear effect of intentions to change. It is important to note that clustering did not appear to be taken into account in the analysis. The authors also cite several methodological considerations including the possibility that the intervention was not delivered as intended and limitations (including limited measures and inappropriate time frame for measurement) in this study that may account for the interventions' lack of success.

Several successful randomized PA promotion in primary care studies have been conducted as well. The Green Prescription Study, a written exercise advice intervention by GPs was evaluated using a randomized controlled trial (Swinburn, Walter, Arroll, Tilyard, and Russell, 1998). Participants (n=491) were patients of and chosen by 37 GPs in New Zealand who were considered likely to benefit from and able to increase their exercise for a period of 6 weeks. Physicians “underwent a training session on assessing and prescribing physical activity” (Swinburn et al., 1998). Physicians assessed current PA and provided verbal PA advice (79% was to increase walking) and an agreed upon PA goal. The physician would then open an envelope revealing randomization to verbal advice only (n=252) or a written green prescription (n=239). The green prescription consisted of receipt of written PA advice and a goal from the physician. The length of time spent assessing and advising PA levels ranged from 2 to 15 minutes, with an average length of 5.1 minutes. Analyses found that after 6-weeks, PA (as measured by 2-week PAR) increased more in the green prescription group (p=0.004). An 11-month follow up survey of a random selection of participants

(n=100) found that 59% (47/80) of those in the green prescription group self-reported maintenance of increased PA suggesting the first long term evidence of success through this type of intervention. However, an important limitation to this study is the lack of a no advice control group.

A replication of the Green Prescription intervention was conducted by Pfeiffer, Clay, and Conatser (2001) utilizing geriatricians (n=3). The intervention was completed in the same manner as the previous study (Swinburn et al. 1998). Analyses revealed that there was an average increase in PA duration of 149 minutes per week, when combining the verbal advice only group (n=25) and the green prescription group (n=24). In contrast, to Swinburn et al.'s findings, there was not a significant difference in the number of participants that reported more PA after 6 weeks. Similarly, there was no significant difference in the increased duration of PA between groups (verbal advice =+180 minutes; green prescription=+116 minutes). Another noted difference was that the geriatricians reported an average of 14-minutes (range=9-25 minutes) to assess and advise PA compared to the 5-minute average reported by Swinburn et al (1998).

Elley, Kerse, Arroll, and Robinson (2003) conducted a long-term cluster-randomized intervention utilizing the Green Prescription approach. Participating practices were stratified by size and randomized to intervention (n=23) or control (n=19). Unlike Swinburn et al. (1998) participants included all willing and eligible (sedentary, healthy enough for PA, aged 40-80) participants who had a regularly scheduled appointment during a 5-day period. Screening occurred in the waiting room and participants received a prompt card (that included

individualized stage of change information) to give to their GP or NP during the consultation. The GP would then provide verbal and written information on increasing PA and a goal would be set for and with the patient. Following the appointment, the written information was then provided to a local sports foundation, where over the course of three months, exercise specialists would make three 10-20 minute phone calls to patients providing encouragement and support. Quarterly newsletters were also sent to the participants. Control GPs provided usual care and control patients were offered the intervention at the end of the trial. At 12-months follow-up, approximately 95% of intervention participants (370/389) recalled receiving a green prescription during the previous year. At one year follow-up, mean total energy expenditure increased by 9.4 kcal/kg/wk ($p=0.001$) and leisure exercise increased by 34 min/wk ($p=0.02$) in intervention participants. The proportion of intervention participants who achieved a minimum of 2.5 hours of moderate and/or vigorous PA per week increased by 14.6% compared to just 4.9% in control participants ($n=361$). Regarding the intervention delivery of 451 intervention participants, 385 received intervention from a GP, while 66 received intervention from a NP. Subsamples of 31 GPs found a 7-minute mean intervention delivery time, while a subsample of 19 NPs spent an average of 13-minutes on intervention delivery. Results based upon intervention delivery provider (GP or NP) are not reported. This was one of the first studies to identify the use of GPs or NPs for intervention delivery and to provide evidence of long-term success of PA counseling in this setting.

A post-hoc analysis of participants aged 65 and older in Elley and colleagues (2003) study was conducted by Kerse, Elley, Robinson, and Arroll (2005). Participants were middle aged and older adults (n=878; mean age=71.6±4.4) in 42 primary care doctors' offices in New Zealand. Twelve months following the green prescription intervention, leisure time moderate activity increased more in the intervention group participants (+40 min/week) than in the control group but did not reach statistical significance. General health on the 36-item Short Form Quality of Life was significantly improved in the intervention group (p=0.005). There was also a significant reduction in hospitalizations among intervention participants (-7%) following the intervention compared to control participants (+6%, p=0.03). This study provides additional long-term evidence of the success of this type of intervention specifically for older adults.

A randomized controlled trial conducted by Jimmy and Martin (2005) compared the effects of physician feedback regarding stage of change for PA to a more comprehensive approach involving stage based hand outs and the opportunity to attend a counseling session with a PA specialist. Five physicians in Zurich, Switzerland were trained to deliver a PA intervention using the Transtheoretical Model and based on patient stage of change. All patients (>15 yrs old) visiting were asked to complete a stage of change questionnaire and PAR-Q. Approximately 10% of patients did not wish to participate in the project. Willing participants currently in precontemplation, contemplation or preparation stages of change were randomized to either the Feedback (n=92) or Advice Plus

(n=69) groups. Feedback only participants received general advice about their current stage of change and general PA recommendations. Advice Plus participants were also provided with a stage specific handout, physician recommendations to increase PA and were offered the opportunity to participate in a 45-minute counseling session with a PA specialist. At 7-wk telephone follow-up, approximately 1/3 of participants in both groups could be considered active ($p=0.69$) as measured through 7-day PAR. Of the Advice Plus participants, over half (60%) could be considered active. By 14-mo follow-up approximately half of all participants were considered active. Over 70% of participants in this group who had chosen to attend counseling were classified as active. Follow-up interviews with physicians found that the intervention was easy to implement. Physicians reported needing 2-10 minutes to discuss PA with patients. Ten interviews were completed with Advice Plus participants (five who chose to attend counseling and five who did not). These participants reported that the project had been useful. Of those attending counseling, the physicians recommendation to do so was the primary incentive, suggesting the benefits of physician based PA interventions. Barriers to attend the counseling session included lack of time and pain (e.g. back pain, rheumatism). These findings indicate that both brief feedback and additional advice with the possibility to attend a counseling session increased PA participation in patients.

The Physically Active for Life (PAL) project was conducted to assess the efficacy and feasibility of another stage of change, physician-based PA intervention aimed at older adults (≥ 50 y) (Pinto, Goldstein, DePue, et al., 1998;

Goldstein et al., 1999). Matched randomization (solo vs. group practice) was conducted allocating 17 physicians each to a control and an intervention group. Physicians and office staff provided a list of eligible patients (ambulatory with a scheduled routine appointment) to the researchers, attended a 1-hour training session (intervention only) and a thirty-minute training session for office staff (intervention and control), and received financial compensation (\$400 reimbursement to practices, \$100 reimbursement for training, \$40 reimbursement per patient follow-up). All participating patients (control n=174; intervention n=181) were asked to provide information including stage of change for PA, exercise history and barriers to becoming active prior to their initial office visit. This information was provided to intervention physicians to be used during counseling. Additionally, physicians followed a patient-centered approach utilizing the “5 As” (address the agenda, assess, advise, assist, and arrange follow-up), which has been found successful in smoking cessation interventions in primary care (Pinto, Goldstein, & Marcus, 1998). During the office visit, intervention physicians were asked to counsel the patient for approximately five minutes, provide a written PA prescription, and a manual with instructions for patient to read the section appropriate to his or her stage of readiness. Follow-up appointments held within four weeks of initial appointment at which time, the physician would provide additional PA counseling and a new PA prescription (Goldstein et al., 1999). Four monthly follow-up mailings were also sent to intervention participants. The PASE and stage of motivational readiness were obtained at baseline, six weeks and eight months over the telephone by trained

research staff. At baseline, there was no significant difference between intervention (n=181) and control participants (n=174). At 6-weeks there were significantly more ($p<0.001$, OR=3.56, 95% CI 1.79-7.08) intervention patients (89%) in advanced stages of readiness (preparation or action) than control patients (74%), but this was not maintained at 8-months follow-up (Goldstein, et al., 1999). There were no significant differences in meeting CDC/ACSM PA recommendations between groups at any of the assessments (Goldstein et al., 1999). At 8-months follow-up, Pinto, Goldstein, DePue, et al. (1998) found that confidence in counseling was significantly improved in intervention physicians yet there were no significant changes in physician reports of exercise counseling provided to all patients. Interestingly, of the intervention participants (n=151) who provided data at six-weeks, 93% reported receiving PA counseling from their physician during the initial visit. When asked about receipt of exercise prescription, 67% of intervention participants reported they had, of which, they rated as moderately useful (3.4 on a scale of 1-5, where 5=extremely useful). These results indicate that the PAL program was effective in some regards, but insufficient in terms of inducing physicians to offer exercise counseling to all of their patients. Pinto Goldstein, DePue, et al. (1998) suggest, "more intensive training is needed to promote physician skill development in this area and generalization of exercise counseling to other patients."

Larger PCP PA promotion studies added the use of fitness measures to examine intervention success. Petrella, Koval, Cunninham, and Paterson (2003) conducted the Step Test Exercise Prescription to evaluate fitness and exercise

self-efficacy among elderly community-dwelling patients following a primary care intervention. Patients randomized to intervention (n=131) completed a step test (20 times up and down on a 9.5cm step) to estimate VO₂max, received exercise counseling, and received information on how to determine heart rate as a method of identifying exercise intensity. Control patients (n=110) received usual care in addition to exercise counseling including ACSM guidelines and benefits of exercise. At 12-months follow-up, VO₂max was significantly increased in the intervention group (14%; from 21.3 to 24.9 ml/kg/min) compared to control (3%; from 22.1 to 22.8 ml/kg/min; p=0.001). Exercise self-efficacy also increased significantly more in the intervention group (32%) compared to a 22% increase in the control group (p=0.001). These results suggest the beneficial impact of a fitness measure used in office.

One of the more complex PCP interventions was conducted by Grandes et al. (2009) in Spain to examine the effectiveness of the Experimental Program for Physical Activity Promotion. Family physicians were randomized to intervention (n=29) or standard care (n=27). Similar to Bull & Jamrozik (1999), Grandes and colleagues (2009) utilized technology to individualize intervention for participants. Web-based software managed the intervention delivery by prompting questions for assessment, individualizing a PA plan for each patient (4-page pamphlet based upon individual readiness and other behavioral factors), and ensuring quality of the intervention (Grandes et al., 2009). At 6-month follow up, intervention participants (n=2248) had significantly increased weekly PA by a mean of 18 minutes (95% CI: 6-31 minutes) compared to standard care patients

(n=2069). This study also utilized VO₂max as estimated by the YMCA cycle ergometer submaximal test as an outcome measure. However, both groups showed a dose response relationship between change in PA and VO₂max. There were no significant differences in VO₂max (p=0.45). Subgroup analyses found that older adults in the intervention group had increased PA by a mean of 35 minutes per week. This is another example of the effectiveness of PA promotion in primary care increasing patient PA levels.

One of the largest physician-based PA promotion interventions was the Activity Counseling Trial (ACT) (King et al., 1998). This intervention was the first to evaluate the effectiveness of increasing and maintaining PA and cardiorespiratory fitness in sedentary participants utilizing two exercise intensities (moderate and vigorous). This was a multi-site intervention utilizing several theoretical constructs from the social cognitive theory (self-regulation, social support, and self-efficacy) and stages of readiness for change from the Transtheoretical model. There were three arms of the study, a standard care/advice care group (n=292), an assistance group (n=293), and a counseling group (n=289) (Writing Group for the Activity Counseling Trial Research Group, 2001).

The standard care group (advice group/comparison group) received physician assessment of current PA, PA goal-setting, and referral to onsite ACT health educator. The assistance group consisted of the standard care treatment provided to the group plus additional staff assistance that included a 17-minute video on the importance of PA, possible PA goals, and role modeling for PA. A

health educator would then review and reiterate the PA goals presented by the physician, provide a community resource guide for PA and a pedometer for self-monitoring. Participants in the assistance group also received 24 newsletters each with a mail-back card for participants to provide minutes and types of PA over the past week. The counseling group received the most intensive intervention approach that consisted of each of the methods in the first two conditions, in addition to on-going telephone counseling (once weekly for initial 2-weeks, biweekly for 6-weeks and once a month for the rest of the first year), in-person counseling (monthly for the duration of the second year was recommended), and behavior change classes.

At two years follow-up, women in the assistance groups and the counseling groups had a significantly higher average VO_{2max} (+80.7 mL/min; +73.9 mL/min, respectively) than women in the advice group (Writing Group for the Activity Counseling Trial Research Group, 2001). There were no significant differences in average total physical activity for women or men in any of the three groups, or men in any of the groups for cardiorespiratory fitness. Further analyses revealed that the cost of the assistance intervention compared to advice was approximately \$500 per participant, and the cost of the counseling intervention was approximately \$1100 per participant over the two-year intervention. Due to the multiple extensive components of this study and likely prohibitive costs, future research is needed to determine feasibility of PA counseling using providers' existing resources.

Several PA promotion studies have been conducted to varying degrees of success in primary care and this is by no means an exhaustive list. The majority of PA counseling primary care interventions have produced short-term success (4-weeks, 6-weeks, and 12-weeks (Calfas et al., 1996; Harland et al., 1999; Kelly, 1988; Lewis & Lynch, 1993; Smith et al., 2000). A few have demonstrated long-term success when patients are followed up at 6-months and 1-year (Elley et al., 2003; Grandes et al., 2009; Kerse et al., 2005; Logsdon et al., 1989).

Characteristics of previous successful primary care interventions include a focus primarily on PA as opposed to several behaviors at once, provision of interactive training for the healthcare providers, and use of a theoretical foundation (Jacobson et al., 2005). The Transtheoretical Model's stages of change were used in a majority of successful studies (Calfas et al., 1996; Elley et al., 2003; Smith et al., 2000).

Additionally, successful primary care interventions often provided more than brief counseling, but multiple intervention components (e.g. written prescription, newsletters, etc) (Calfas et al., 1996; Elley et al., 2003; Grandes et al., 2009; Harland et al., 1999; Kerse et al., 2005; Smith et al., 2000). However, this type of approach may be considered too intensive for physicians seeing patients regularly (Tulloch et al., 2006). Additionally, some PCP studies featured advice delivered by the physician, yet had PA assessed and other data collected by a nurse or other office staff (Eden, Orleans, Mulrow, Pender, and Teutsch, 2002; Goldstein et al., 1998; Grandes et al., 2009; Norris, Grothaus, Bucner, and Pratt, 2000; Smith et al., 2000). Therefore, PA assessment and counseling delivered by

other health providers, such as NPs and physician assistants, is worth consideration as they may be able to provide this type of attention to patients on a regular basis. Tulloch and colleagues (2006) suggest that this population may be better suited for providing PA promotion in primary care due to an increased ability to spend more time and provide a more intensive intervention.

Nurse Practitioners and Physician Assistants as Providers

Nurses are an important part of primary health care. Nurse practitioners are advance practice nurses that are trained to diagnose and treat several health problems (AANP, n.d.). NPs have graduate education and clinical training beyond registered nurse preparation, including master and doctoral level degrees (AANP, n.d.). As of 2009, there are approximately 125,000 practicing NPs in the U.S. undertaking nearly 600 million visits yearly (AANP, n.d.). In Arizona, there are approximately 3,555 NPs in Arizona (Arizona State Board of Nursing, 2011).

Physician assistants are health care professionals that are licensed to practice medicine in association with a physician (Mittman, Cawley, & Fenn, 2002). Physician assistants are trained to provide the same quality of primary care as physicians, including interviewing, examining, evaluating, diagnosing, and treating patients. As of 2008, there were approximately 74,000 physician assistants practicing in the U. S. (AAPA, 2008). In Arizona, there are approximately 1,668 practicing physician assistants (Everett, Schumacher, Wright, and Smith, 2009).

Primary Care Interventions with Non-Physician Providers

The NP field is unique in that NPs work beyond clinical care to include an emphasis on health promotion and disease prevention. This focus on health education and promotion provides a platform for increasing PA counseling. Burns, and colleagues (2000) surveyed 396 currently practicing primary care NPs. Respondents were 97% female, and had an average age of 44.5 years, ranging from 25 to 74. The average length of practice was 7.8 years and the average age of clients was 46 ± 15 years. Almost all respondents (99%) reported asking clients about PA and 84% indicated that they use clients' height and weight as an indicator of patient PA level. Fewer respondents reported providing clients (67%) with written exercise information and 43% of respondents reported referring clients to an outside exercise specialist. The most popular activities that respondents reported recommending to patients include walking (98%), swimming (70%), biking (59%) and household activities (51%). The majority of NPs reported recommending a frequency of three times a week (70.7%) to engage in these activities and 66% recommended 30 minutes duration per bout. Moderate intensity was recommended by most NPs, such as walking a brisk pace of 3 to 4 mph. Use of the "talk test" and heart rate (60-85% of maximum) were the second and third most commonly recommended methods of determining intensity. The survey included four questions on knowledge and confidence to assess and counsel PA using a scale of 1 to 5 each where 1 was the least amount. Respondents had a mean score of 3.7 ± 0.9 for knowledge of PA and 3.7 ± 0.9 for knowledge to counsel. Confidence to assess PA had a mean score of 3.7 ± 0.9 and confidence to counsel PA had a score of 3.8 ± 0.9 .

A similar study by Buchholz and Purath (2007) surveyed 96 NPs (16% response rate) using the questionnaire used by Burns, Camaione, and Chatterton (2000) with an added section examining physical fitness assessment and personal PA practices. Approximately 95% of respondents reported that they provide PA counseling to a patient at least once a year. Approximately 94% reported that they question patients about duration and intensity of PA. Assessment of height, weight, and general appearance were used by 88% of respondents. Discussion of PA (95%) and provision of written materials (54%) were the most common methods of counseling. The majority of respondents advised patients to participate in PA on most days of the week (57%) for 30-minute bouts (66%). Similar to the findings of Burns et al. (2000), moderate intensity was recommended by most NPs, followed by the talk test and 60-85% of max heart rate. In this survey, respondents had a mean score of 3.2 ± 0.9 for knowledge of PA and 3.4 ± 0.9 for knowledge to counsel. Confidence to assess PA had a mean score of 3.8 ± 0.8 and confidence to counsel PA had a score of 3.8 ± 0.9 . Only 17% of respondents reported using physical fitness measures. The most commonly used were YMCA 3-minute step test (7%) and the Rockport 1-mile test (4%). Both the balance stand and balance walk tests were used more often (19% and 20%, respectively). Regarding their own PA practices, 75% of respondents reported engaging in moderate PA for 30-minute bouts on most days of the week.

McDowell, McKenna, and Naylor (1997) surveyed 196 practice nurses (NPs) (72% response rate) in the UK to determine factors that influence PA promotion. All respondents were female with a mean age of $43.6 (\pm 7.9)$ and a

mean duration of work as NPs for 22.5 (± 8.4) years. The majority (80.1%) of the sample reported being in the maintenance stage of the Transtheoretical Model stages of readiness for behavior change regarding the promotion of PA. Less (56.1%) reported maintenance stage for their own PA participation. For the whole sample, an average amount of physical activity promotion training was 5.2 hours (± 15.1). Approximately 37% had not received any formal physical activity promotion training. NPs that reported promoting PA had more PA promotion training (mean=6.18 hours) over the past five years compared to NPs that were not promoting PA (mean=1.51 hours). The top two barriers to PA promotion were lack of time and a lack of protocol. As a result of the findings, the authors point out three avenues for future development: (1) encouragement of NPs to promote PA, (2) development of a PA specialty for NPs and (3) provision of resources for NPs to develop skills for PA promotion.

A cross-sectional survey of 398 NPs (43% response rate) of NPs was conducted at a National Advance Practice in Primary and Acute Care conference in the Northwest (Tompkins, Belza, & Brown, 2009). Of respondents, 92% were female, 60% practiced in primary care and the mean number of years practicing as NPs was 11.7 (± 7.9). Half of respondents reported counseling their patients on exercise at least 75% of the time. The most commonly reported approaches for exercise recommendations included discussion (56.3%), referral to physical therapist (26.7%) and general recommendation of an exercise program (25.6%). The majority of respondents reportedly believe that exercise counseling is as valuable as pharmaceutical prescription. Similar to previous survey findings,

barriers to exercise counseling included perceived lack of patient interest (87.3%) and length of patient visit (68.1%). Facilitators to counseling include patient interest (87.4%), length of patient visit (69.2%), and part of preventive health visit (55.4%).

Only one study provides qualitative data from NPs regarding PA counseling. Melillo and colleagues (2000) conducted FGs with NPs to help determine their perceptions regarding their role in PA prescription in primarily older adult patients. Two 75-minute FGs were held with six and seven participants in each. The interview guide consisted of nine questions including how PA recommendations are integrated into visits with patients, what guidelines are used by NPs in physical fitness assessment and exercise recommendations, and what percentage of a visit is devoted to counseling for PA. Results indicated that NPs feel it is their responsibility to question their patients about PA. However, none of the respondents identified a specific guideline for PA, instead suggesting that it would depend on cognitive and physical impairments (e.g. frailty) of the individual patient. All the FG participants noted that other than a health history form, they did not use any questionnaires or guidelines to determine current PA of patients. Some participants suggested that NPs should have a form for this purpose, while the rest of participants thought that there was already too much paperwork. All the NP participants indicated that only a small percentage of a visit could be devoted to counseling, for example 3-5% of a 25-30 minute visit. NP participants described the older adult population as more resistant to PA and described needing more time to convince older adults of the importance of PA.

The researchers conclude that more research is needed to examine current curriculum in NP programs regarding exercise and counseling and that continuing education programs for NPs in these areas may be advantageous.

There have been a few reported primary care interventions implemented with nurses as the point of contact for general healthy lifestyle and dietary promotion. Roderick, Ruddock, Hunt, and Miller (1997) conducted a study to compare the effectiveness of structured dietary advice by NPs to standard health promotion advice. Participants (35-59 years old; n=473 dietary advice; n=483 usual care) were recruited by their GPs to participate in the study. Eight practices were randomized (4 each) to intervention or usual care. Intervention consisted of receipt of health education pamphlets (on healthy eating, smoking cessation, heart disease prevention, and exercise) in addition to dietary advice based on food substitution provided by NPs. Usual care received pamphlets only. At 1-year follow-up, intervention group experienced a small mean decrease in total and saturated fat, and an increase in fiber intake. The intervention group also had marginally significant decreases in serum cholesterol (0.20 mmol/l), weight (-0.56 kg), and factor VII coagulant (-6.7%). This study suggests that structured dietary advice by NPs can initiate positive dietary changes up to a year following intervention.

Step toe et al. (1999) conducted a behavioral counseling intervention delivered through nurses on risk factors for coronary heart disease. Participants were recruited on the basis of one or more risk factors for coronary heart disease. Intervention consisted of three counseling sessions with trained NPs if

participants had a minimum of two risk factors or two sessions with one risk factor. At 4- and 12-months follow-up, intervention participants had increased their number of exercise sessions from baseline more than control participants (3.7% difference in change; 95% CI 1.3-6.2). Similar improvements were made in dietary intake and smoking. Systolic blood pressure was significantly reduced at 4-months, but this was not maintained at 12-months.

Kastarinen et al. (2002) conducted a study to compare lifestyle counseling (sodium intake, alcohol consumption, exercise, and smoking) to usual care. Participants (n=360) met with public health nurses four times over the course of a year and three times the following year. The intervention consisted of written instructions to change individualized health behaviors. Usual care participants (n=355) were instructed to meet with physicians and nurses according to usual practice. At two-year follow-up, a greater proportion of intervention participants had increased their PA levels compared to usual care participants (11.3% difference in change; 95% CI 1.8-20.8).

The Oxford and collaborators health check trial (OXCHECK) was conducted to determine the effects of health checks delivered by nurses in primary care on risk factors for CVD and cancer (Imperial Cancer Research Fund OXCHECK Study Group [OXCHECK], 1995). After initial identification through a family practice register and mailed lifestyle questionnaires, 11,090 eligible participants were randomized to either intervention (yearly health checks) or control (health check at year three). Health checks included a medical history, lifestyle questionnaire, anthropometry, structured dietary assessment, and blood

work. Health checks took approximately 45-60 minutes, while follow-up visits took approximately 10-20 minutes. After three years, mean serum cholesterol (-3.1%), self-reported saturated fat intake (butter and milk use), systolic and diastolic blood pressure (-1.9% each), and body mass index (-1.4%) were significantly lower in intervention participants. There was no significant difference in smoking or alcohol use. Patients participating in vigorous exercise less than once a month was significantly lower (-3.3%). Following initial health checks, intervention participant visits to nurses increased significantly while visits to GPs remained the same, particularly in participants with more CVD risk factors. While these studies (Kastarinen et al., 2002; OXCHECK, 1995; Roderick et al., 1997; Steptoe et al., 1999) suggest that primary care interventions utilizing nurses as sole delivery providers can be successful, there is little information regarding nurse PA interventions aimed primarily at healthy individuals (e.g. not at risk for cardiovascular disease).

Other primary care interventions have utilized a team approach for delivery. Little et al. (2004) conducted a randomized trial to compare three approaches to increasing PA in patients (n=151) with one or more risk factors for coronary disease. The three intervention factors included: (1) Prescription by GP for exercise (not requiring a specific facility, such as walking outside) for 30 minutes a day for 5 days, (2) Counseling by a NP to modify intentions and perceived control, and using behavioral implementation techniques, and (3) Use of education authority booklet entitled "Getting active, feeling fit." Participants were randomized to one of eight groups: 1. Control group, 2. GP prescription only,

3. Booklet, 4. GP and booklet, 5. Nurse, 6. Nurse and booklet, 7. GP and nurse, 8. GP, nurse, and booklet. At 1-month follow-up, analyses revealed that the most intensive intervention yielded the highest increases in PA ($p=0.02$) and fitness ($p=0.05$). Counseling and the booklet together increased distance walked more than either alone. Counseling increased PA in individuals with the lowest intention or stages of change at baseline. Intervention using both GPs and nurses was more effective than either alone.

As previously mentioned, Elley and colleagues (2003) conducted their green intervention in sedentary New Zealanders aged 40-79. After screening, to determine PA levels, patients received the intervention using a form provided by the researcher to prompt their GP or NP during their appointment to deliver the green prescription. Of 451 intervention participants, 385 received intervention from a GP, while 66 received intervention from a NP. Subsamples of 31 GPs found a 7-minute mean intervention delivery time, while a subsample of 19 NPs spent an average of 13-minutes on intervention delivery. Mean total energy expenditure increased by 9.4 kcal/kg/wk ($p=0.001$) and leisure exercise increased by 34 min/wk ($p=0.02$) in intervention patients. Results based upon intervention delivery provider (GP or NP) are not reported.

Overall, the research that has been conducted utilizing nurses or NPs to deliver health promotion interventions to patients in primary care have been successful (Kastarinen et al., 2002; OXCHECK et al. 2005; Roderick et al., 1997; Steptoe et al., 1999). However, only one of these interventions was directed solely

at physical activity and in this study, approximately 15% of participants (66/451) had a NP deliver the intervention as opposed to a GP.

Whether utilizing nurses or NPs alone or in conjunction with physicians, interventions in primary care can lead to improvements in healthful activities. Future studies are needed to examine PA knowledge, sources of knowledge, interest in and practices related to PA counseling in this population. This information can help to identify future training protocols for interventions utilizing this population to increase success in primary care PA promotion.

While some research has been conducted regarding the PA promotion practices of NPs, little is known about these practices in physician assistants. The percentage of physician assistants that assess their patients PA participation or provide counseling is unknown. Further, typical educational training regarding PA knowledge and counseling, and counseling practices of physician assistants is unknown.

Summary

In summary, there is a need for PA promotion interventions in primary care and evidence that providers want to provide PA information to their patients. Several quasi-experimental and randomized trials have been conducted evaluating the efficacy and effectiveness of primary care PA promotion interventions (see Tables 2 & 3). Typical protocol for these interventions have included screening of patients within the waiting room, followed by brief PA counseling (verbal and sometimes written materials) by physicians (primarily) and non-physician clinicians such as NPs. Patient follow-up varied from 4-weeks to 12-months and

included additional physician visits, telephone calls, and/or mailings. While not all primary care PA promotion interventions were successful, the majority of studies support this approach to increasing PA. It is the position of several organizations that primary care providers should incorporate PA counseling into patient visits (Jacobson et al., 2005).

Surveys of primary care providers suggest that the primary barriers to PA counseling include lack of time, needing to address more important issues and insufficient educational materials (Buchholz & Purath, 2007; Bull et al., 1995; Burns et al., 1995; Lawlor et al., 1999; Rogers et al., 2002; Sherman & Hershman, 1993). Such evidence reinforces the potential usefulness of non-physician clinicians, such as NPs and physician assistants, as PA promoters in primary care. Tulloch and colleagues (2006) suggest that this population may be better suited for providing PA promotion in primary care due to an increased ability to spend more time and provide a more intensive intervention. Although the current limited body of literature provides some information regarding the attitudes and confidence of NPs to promote PA is positive, there is no information regarding physician assistants in primary care PA counseling.

Table 1
Summary of Primary Care Provider Survey Studies

Study	Sample Population	Methods	Results
Abramson et al., 2000	<p><u>n</u>= 298 <u>M Age</u>= 50 yrs <u>Gender</u>= 77% male <u>Recruitment</u>: Random Sample (N=1200) of PCPs who were members of the American Medical Association <u>Response Rate</u>=25%</p>	<ul style="list-style-type: none"> • 34-Item questionnaire examining personal exercise habits and counseling practices • Validity and reliability NR 	<ul style="list-style-type: none"> • 73% of PCPs reported engaging in aerobic exercise • 41% of PCPs reported engaging in strength-training • PCPs who participated in aerobic exercise were more likely (OR: 5.72; 95% CI: 2.41- 13.45) to counsel patients on aerobic activity (P<0.0005) • PCPs who participated in strength-training were more likely (OR: 4.55; 95% CI: 2.61- 7.91) to counsel patients on strength-training (P<0.0005) • Younger PCPs (age NR) were more likely to counsel their patients on PA than older PCPs (age NR) • Verbal counseling was the most common method
Buchholz & Purath, 2007	<p><u>n</u>= 96 <u>M Age</u>= 50 ± 7.1 yrs <u>Gender</u>= 95% female <u>Recruitment</u>: Random Sample (N=960) of American Academy of Nurse Practitioner Members <u>Response Rate</u>= 10%</p>	<ul style="list-style-type: none"> • Modified version of the Promotion of Physical Activity by Nurse Practitioners Questionnaire (Burns, Camaione & Chatterton, 2000) • 30-item questionnaire examined PA assessment and counseling practices, and knowledge, confidence in and barriers to PA counseling • Validity and reliability NR 	<ul style="list-style-type: none"> • PA most commonly assessed by asking patients about PA intensity and duration (94%), followed by checking height, weight and general appearance • Most salient PA counseling barriers reported were: lack of time (48%), more pressing health concerns (47%) and lack of receptiveness (43%) • 61% of NPs had no formal training in PA assessment or counseling; workshops/conferences (43%) and self-study (37%) were primary sources for info • NPs with formal training reported greater knowledge and confidence to assess and counsel patients on PA (p<0.05) • 75% of NPs reported engaging in PA for 30 minutes most days of the week
Bull et al., 1995	<p><u>n</u>= 789 <u>M Age</u>= 45 ± 11 yrs <u>Gender</u>= 69% female <u>Recruitment</u>: All GPs in Perth, Australia (N=1228)</p>	<ul style="list-style-type: none"> • Questionnaire examined current and desirable counseling practices and barriers to PA counseling • Length, validity and reliability 	<ul style="list-style-type: none"> • 93% of GPs reported counseling symptomatic patients who could be helped with exercise • 48% of GPs asked new and 38% asked previously seen patients about PA • More than ¾ of GPs thought new and returning patients

	<u>Response Rate</u> =71%	NR	<p>should be screened for exercise level</p> <ul style="list-style-type: none"> • 21% of GPs recommended PA to all patients • Barriers to PA counseling were lack of time (47%) and insufficient educational materials (29%)
Burns, Camaione, & Chatterton, 2000	<p><u>n</u>= 606 <u>M Age</u>= 44.5 yrs <u>Gender</u>= 97% female <u>Recruitment</u>: Randomly selected group of American Academy of Nurse Practitioner members (N= 1000) <u>Response Rate</u>= 60%</p>	<ul style="list-style-type: none"> • Promotion of Physical Activity by Nurse Practitioners Questionnaire • 26-item questionnaire examined PA assessment, counseling practices, knowledge and confidence in counseling and barriers to counseling. • Validity and reliability NR 	<ul style="list-style-type: none"> • 99% reported assessing patients for PA • Of these, 67% provide clients with written information and 43% refer patients to an exercise specialist. • Approximately 84% used height and weight as a PA indicator. • Barriers to counseling included lack of time (62%) and need to address more important concerns (58%). • Factors associated with predicting counseling: knowledge to counsel (OR: 2.01; 95% CI: 1.46-2.77), additional education about PA (OR: 2.29; 95% CI: 1.22-3.13), and being physically active (OR: 1.96; 95% CI: 1.39-3.77).
Connaughton, Weiler, & Connaughton, 2001	<p><u>n</u>= 72 Participant demographics NR <u>Recruitment</u>: All identified deans and directors of 128 schools of medicine in US (N=128) <u>Response Rate</u>= 56%</p>	<ul style="list-style-type: none"> • Exercise and Physical Activity Competence Questionnaire developed for this study • 17 items examined dean/director beliefs of graduating medical students : <ul style="list-style-type: none"> • Competence of medical school students (6 questions, Likert scale [1-6], $\alpha=0.83$) • Importance of prescribing patient exercise and physical activity (6 questions, Likert scale [1-6], $\alpha=0.86$) • Medical school curriculum (7 forced choice items). 	<ul style="list-style-type: none"> • 58% of respondents reported belief that their graduates were competent to evaluate patients prior to starting an exercise program. • 10% reported that their students could design an exercise program. • 6% of respondents reported provision of a core course referencing ACSM Guidelines for Exercise Testing and Prescription • 46% were unsure if topics related to this were offered in any core courses.
Douglas et al.,	<u>n</u> = 757 (376 GPs, 212 NPs,	• Questionnaire	<p>d for this</p> <ul style="list-style-type: none"> • 13% of GPs, 9% of HVs, and 7% NPs could correctly

2006	<p>169 HVs) Demographics NR <u>Recruitment</u>: Sample of general practitioners (GPs), practice nurses (NPs), and health visitors (HVs) from four regions in Scotland (N= 1408; 802 GPs, 317 NPs, 289 HVs) <u>Response Rate</u>= 54% (47% GPs, 67% NPs, 58% HVs)</p>	<p>study (some questions adapted from Lawlor et al., 1999).</p> <ul style="list-style-type: none"> • Examined attitudes, knowledge, practices, and barriers regarding exercise counseling in GPs, NPs, and HVs. • Length, validity, and reliability NR 	<p>describe exercise recommendations.</p> <ul style="list-style-type: none"> • HVs (88%) and NPs (90%) were more likely to recommend exercise to apparently healthy adults than GPs (62%). • For specific medical conditions, GPs and NPs were more often to recommend PA than HVs. • Lack of time and lack of financial incentives were considered more of a barrier to GPs than NPs and HVs. • For all respondents, 40-60% thought that educational materials were insufficient for their needs and there was a lack of training regarding knowledge to advise PA.
Frank et al., 2008	<p>n= 1846 Freshman; 1630 Wards; 1469 Seniors <u>M Age</u>= NR <u>Gender</u>= 61% female (Freshman year); 56% female (Wards); 62% female (Senior year) <u>Recruitment</u>: All medical school graduates in 2003 from 16 U.S. schools (N= 2080 Freshmen; 1982 Wards; 1901 Seniors) <u>Response Rate</u>= 89% Freshman year; 82% Wards; 77% Senior year</p>	<ul style="list-style-type: none"> • Examined perceived relevance of PA counseling in intended practice and self-reported frequency of counseling to a “typical” patient at freshman orientation, orientation to wards, and during senior year. • Length, validity and reliability NR 	<ul style="list-style-type: none"> • Across the four years, approximately 61% of students reported adherence to the CDC physical activity recommendations. • Students who felt more positively about their schools and classmates’ attitude toward exercise promotion were more likely to be adherent to these recommendations. • More respondents perceived exercise counseling to be highly relevant to their intended practices at entry to ward than at senior year (69% vs. 53%; p<0.01).
Lawlor, Keen, & Neal, 1999	<p>n= 174 Participant demographics NR <u>Recruitment</u>: All GPs in Bradford district of the UK (95 practices; N= 235) <u>Response Rate</u>= 74%</p>	<ul style="list-style-type: none"> • Examined knowledge, attitudes and practices of PA promotion among GPs. • Length, validity and reliability NR 	<ul style="list-style-type: none"> • 75% of respondents reported that any level of PA was beneficial. • However, only 8% reported that they would give PA advice to all patients. • Over ¾ of respondents self-reported sufficient knowledge of PA counseling. • Barriers to promoting PA included lack of time (92.5%),

			belief of irrelevance of PA to consultation (68.4%), and belief that patients would not heed advice (55.2%).
			<ul style="list-style-type: none"> Majority of respondents believed PA advice would be followed more successfully if linked to specific health problems.
Lewis et al., 1991	<p><u>n</u>= 1349 <u>M Age</u>= 44 yrs <u>Gender</u>= 6% female <u>Recruitment</u>: Random stratified sample of American College of Physicians members from 21 U.S. regions (N= NR) <u>Response Rate</u>= 75%</p>	<ul style="list-style-type: none"> Questionnaire examined the following dimensions of counseling: (1) Aggressiveness (time, frequency, and patient type), and (2) Indications (exercise, smoking, alcohol, seat belt use). Length, validity, and reliability NR 	<ul style="list-style-type: none"> 38% of respondents reported being extremely or quite active. Of the respondents reporting being extremely active, 41% counseled all inactive patients compared with 28% of less active respondents ($p<0.001$). Among physicians who counsel, approximately 48% reported spending over 3 minutes counseling about exercise.
McDowell, McKenna, & Naylor, 1997	<p><u>n</u>= 220 <u>M Age</u>= 43.6±7.9 yrs <u>Gender</u>= 100% female <u>Recruitment</u>: All practice nurses (NPs) in Avon county, UK (N= 272) <u>Response Rate</u>= 80.9%</p>	<ul style="list-style-type: none"> Questionnaire examined patient health, personal factors (age, sex, stage of change), and practice factors (number of providers, patients, barriers) influence on physical activity promotion. Length, validity, and reliability NR 	<ul style="list-style-type: none"> 80% reported being in the maintenance stage of change for PA promotion 56% reported being in the maintenance stage for their own PA. NPs own PA, but not stage of change for promotion was associated with counseling. There was a significant difference in hours of training that NPs promoting PA received (6.18 hrs) compared to NPs not promoting PA (mean=1.51 hrs). 37% of sample had not received any formal PA training.
Rogers et al., 2002	<p><u>n</u>= 251 <u>M Age</u>= 30±3.8 yrs <u>Gender</u>= 42% female <u>Recruitment</u>: Internal medicine residents at six US training programs (N= 313) <u>Response Rate</u>= 92%</p>	<ul style="list-style-type: none"> 85-item questionnaire adapted from previous questionnaires (Sherman & Hershman, 1993; Bull et al., 1995) Examined behavior, knowledge, and attitudes regarding exercise counseling among resident physicians: <ul style="list-style-type: none"> Perceived success when 	<ul style="list-style-type: none"> 69% reporting enjoying exercise personally 44% reported engaging in exercise (intensely enough to sweat) at least three times per week 27% reported receiving training in exercise counseling in medical school 58% reported not receiving exercise training in medical school 91% of respondents felt that more training in exercise counseling would be beneficial

		<p>counseling (6-item scale, $\alpha=0.75$);</p> <ul style="list-style-type: none"> • Confidence in counseling (9-item scale, $\alpha=0.87$); • Counseling as a priority (4-item scale, $\alpha=0.65$); • Obstacles to exercise counseling (4-item scale, $\alpha=0.68$). 	<ul style="list-style-type: none"> • Approximately 70% spent \leq five minutes discussing exercise with patients on an average visit. • 96% felt it was their responsibility to provide exercise counseling • Only 28% felt confident to prescribe exercise. • Top three barriers included medical problems that interfere with exercise (65%), medical problems as a higher priority (61%), and lack of time (56%). • Predictors of confidence in counseling include being male ($p<0.001$), perception of importance of exercise for a healthy 35-year old ($p<0.01$), feeling successful at counseling ($p<0.001$), perceiving less barriers to counseling ($p<0.001$) and prior training in exercise counseling ($p<0.05$).
Sherman & Hershman, 1993	<p><u>n</u>= 422 <u>M Age</u>= 41 yrs <u>Gender</u>= 25% female <u>Recruitment</u>: Random sample of internists in Massachusetts (N= 1000) <u>Response Rate</u>= 61%</p>	<ul style="list-style-type: none"> • 80-item questionnaire developed for this study • Examined attitudes, beliefs, practices, barriers regarding exercise counseling and personal exercise frequency. 	<ul style="list-style-type: none"> • Factors associated with likelihood of counseling: perceived success with getting patients to begin exercise (OR: 22.74; 95% CI: 10.95-47.24), perceived success with getting patients to continue exercising (OR: 14.60; 95% CI: 10.95-47.24), belief that exercise is very important (OR:4.86; 95% CI: 1.70-13.91), slower resting physician heart rate (OR: 2.56; 95% CI: 1.41-4.76), and personal exercise habits (OR: 2.69; 95% CI: 1.50-4.85). • Barriers to counseling: lack of time, lack of perceived counseling effectiveness, lack of counseling skills.
van der Ploeg et al., 2007	<p><u>1997</u>: <u>n</u>= 325; <u>2000</u>: 397 <u>M Age</u>= NR <u>Gender</u>= 28% female; <u>2000</u>: 30% <u>Recruitment</u>: Representative selection of GPs from 37 divisions within New South Wales (95 practices; N= NR)</p>	<ul style="list-style-type: none"> • 5-item questionnaire (1-5 Likert scale) examining GPs perceptions and practices regarding PA in 1997 and 2000. • Validity and reliability 	<ul style="list-style-type: none"> • No significant differences in respondent characteristics from 1997-2000. • Respondents reporting attending a workshop related to increasing PA over the past 12 months increased from 35 to 44% ($p<0.01$). • General knowledge of physical activity increased ($p<0.01$). • Confidence in providing general (83 vs. 92%; $p<0.01$) and specific (63% vs. 71%; $p=0.02$). • There was no change in occurrence of PA discussions with

	<u>Response Rate</u> = 58%; <u>2000</u> : 53%		new patients (31% vs. 31%) or established patients (27% vs. 27%) from 1997 to 2000.
Vickers et al., 2007	<u>n</u> = 152 (52 NPs not included in analysis) <u>M Age</u> = 45.4±9.1 yrs <u>Gender</u> = 60% female <u>Recruitment</u> : All primary care physicians associated with Mayo clinic in Rochester (n=185) <u>Response Rate</u> = 82%	<ul style="list-style-type: none"> • Questionnaire examined variables associated with confidence to counsel and PA counseling rate. • Length, validity, and reliability NR. 	<ul style="list-style-type: none"> • Almost 70% of respondents reported being more likely to counsel patients on health behaviors that they are successful at engaging in themselves. • Approximately 86% of respondents reported feeling more confident in counseling on health behaviors successfully engage in themselves. • Factors associated with confidence to counsel: more years of clinical training, greater extent of counseling training, and greater perceived importance of counseling.
Wells et al., 1986	<u>n</u> = 455 <u>M Age</u> = 37 yrs <u>Gender</u> = 11% female <u>Recruitment</u> : Recent graduates of family practice and internal medicine residencies in the US (N= 628) <u>Response Rate</u> = 72%	<ul style="list-style-type: none"> • <i>Physician Practice Study</i> • 8-item questionnaire examined practice characteristics of recent residency graduates, indications for routine PA counseling, aggressiveness of counseling style and specific techniques used ($\alpha > 0.80$ for each scale). 	<ul style="list-style-type: none"> • Common counseling techniques included discussion of risks, benefits and specific steps to take. • Among those who counsel, 57-61% spend less than 2 min. a visit and 36-47% counsel only when habit presented is an immediate health hazard. • Approximately 15% of respondents counsel most of patients with poor exercise habits about exercise. • 56% of respondents counsel most of their patients with heart disease about exercise. • 12% of respondents reported never counseling.

Table 2
Summary of Primary Care Quasi Experimental Studies

Study	Design	Characteristics of Intervention	Outcomes
Bull & Jamrozik, 1999	<p><u>Participants</u> N= 763 <u>M Age</u>= 50 yrs Allocated by day of the week consultation occurred:</p> <ol style="list-style-type: none"> 1. <u>Standard intervention</u> n= 193 (60% female) 2. <u>Tailored intervention</u> n= 223 (72% female) 3. <u>Control</u> n= 347 (gender NR) <p><u>Family physicians</u> N= NR (10 practices)</p>	<p><u>1. Standard intervention:</u></p> <ul style="list-style-type: none"> • Verbal advice from physician and mailed standard pamphlet on exercise <p><u>2. Tailored intervention:</u></p> <ul style="list-style-type: none"> • Verbal advice from physician and mailed tailored (to stage of change, barriers, and preferred type of exercise) pamphlet <p><u>3. Control</u></p>	<p><u>1-mo, 6-mo follow-up:</u></p> <ul style="list-style-type: none"> • Compared to control, participants in both interventions increased PA at 1-mo (p<0.01) and 6-mo (p<0.02) <p><u>12-mo follow-up:</u></p> <ul style="list-style-type: none"> • No significant differences in PA, or stage of readiness for change between groups
Calfas et al., 1996	<p><u>Participants</u> N= 255 <u>M Age</u>= 39 yrs <u>Gender</u>= 84% female Allocated based upon physician:</p> <ol style="list-style-type: none"> 1. <u>Intervention</u> n=98 2. <u>Control</u> n=114 <p><u>Physicians</u> N= 22 (17 practices); physicians chose to be intervention providers or control</p>	<p><i>PACE</i></p> <p><u>1. Intervention:</u></p> <ul style="list-style-type: none"> • Physician provided 3-5 min. of structured exercise counseling and prescription based on patient stage of change • Health educator's provided 10-min. booster 2-wks later and mailed tip sheets if requested <p><u>2. Control</u></p>	<p><u>4-6 wk follow-up:</u></p> <ul style="list-style-type: none"> • Group 1 participants had significantly higher mean PACE scores, walking (+37 min/wk vs. + 7 min/wk for control), and accelerometer activity counts (+33%)
Kelly, 1988	<p><u>Participants</u> N= 326 <u>M Age</u>= NR <u>Gender</u>= 74% female Intervention groups randomized to 1, 2, or 3, with nonparticipants randomly selected for group 4:</p> <ol style="list-style-type: none"> 1. <u>Intervention 1</u> n= 88 2. <u>Intervention 2</u> n= 88 3. <u>Intervention 3</u> n= 88 4. <u>Control</u> n= 44 <p><u>Family practice residents</u> N= 18 (1 practice)</p>	<p><u>1. Intervention 1:</u></p> <ul style="list-style-type: none"> • Lifestyle assessment, risk factors, physician advice, lifestyle prescription and instructional materials tailored to risk factors <p><u>2. Intervention 2:</u></p> <ul style="list-style-type: none"> • Assessment and provision of instructional materials from nurse for all lifestyle areas <p><u>3. Intervention 3:</u></p> <ul style="list-style-type: none"> • Assessment only <p><u>4. Control</u></p>	<p><u>4-wk telephone follow-up:</u></p> <ul style="list-style-type: none"> • All intervention participants in had a greater change in mean activity score than control participants (p=0.001) • Greatest change in the multi-component intervention (group1) • Motivation to change was strongest predictor of change

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		<ul style="list-style-type: none"> • Did not take assessment 	
Lewis & Lynch, 1993	<p><u>Participants</u> N= 383 <u>M Age</u>= 35 yrs (females); 42 yrs (males) Every other person allocated to intervention: 1. <u>Advice</u> n=162 (77% female) 2. <u>Control</u> n=221 (56% female) <u>Family physicians</u> N= 24 (1 practice)</p>	<p><u>1. Advice:</u></p> <ul style="list-style-type: none"> • Physicians could choose to provide 2-3 min verbal exercise advice and an exercise handout. • Protocol consisted of asking about exercise, assessing response and advising accordingly. • Physicians could choose to omit advice if too busy or if patient seemed to be a poor candidate. <p><u>2. Control</u></p>	<p><u>1-mo telephone follow up:</u></p> <ul style="list-style-type: none"> • Exercise duration increased in group 2 (108.7 min/wk) compared to group 1 (-23.7; p<.05) • Exercise frequency did not significantly change (0.7 vs. 0.4 p=0.4)
Logsdon, Lazaro, & Meier, 1989	<p><u>Participants</u> N= 2218 <u>M Age</u>= NR Eligible patients, stratified by age were randomly selected to complete survey: 1. <u>Intervention</u> n= 1409 (45% female) n=811 treated (42% female) n=598 untreated (49% female) 2. <u>Control</u> n= 809 (60% female) <u>PCPs</u> N= 72 (5 practices) 1. Intervention n=46 (3 sites) 2. Control n=26 (2 sites)</p>	<p><u>1. Intervention:</u></p> <ul style="list-style-type: none"> • After completion of surveys, participants were asked to request follow-up appointments (self-selection) with their physicians. • At these appointments, physicians used age group specific prevention-oriented forms to record risk history (lack of exercise, high blood pressure, excessive dietary fat, overweight, and alcohol misuse, etc) and provide tailored verbal and written health advice. <p><u>2. Usual care</u></p>	<p><u>12-mo survey follow-up:</u></p> <ul style="list-style-type: none"> • Significant difference in starting regular exercise between treated intervention and control patients at follow-up (OR: 1.12-2.43; 95% CI 1.12-2.43; p=0.02) • When treated and untreated intervention groups are collapsed this difference lost significance (OR 1.39; 95% CI 0.99-1.96; p=0.06)
Marcus et al., 1997	<p><u>Participants</u> N= 44 older adults <u>M Age</u>= 67 yrs <u>Gender</u>= 72% female Sequential group design: 1. Experimental n=19 2. Control n=25 <u>Physicians</u> N= 4 (1 practice)</p>	<p><u>1. Experimental:</u></p> <ul style="list-style-type: none"> • After training, physicians provided 3-5 min of stage-matched counseling (ask, assess, advise, assist, advise), a PA booklet, and a PA prescription. • Follow-up PA counseling in office 1 month following first visit <p><u>2. Usual care:</u></p>	<p><u>2-wk telephone follow-up:</u></p> <ul style="list-style-type: none"> • Approximately 2/3 of controls reported receiving PA counseling form physician <p><u>6-wk follow-up:</u></p> <ul style="list-style-type: none"> • Both groups increased PA (PASE score; p>0.05) • The increase was greater in the

		<ul style="list-style-type: none"> • Conducted prior to intervention 	<p>experimental group</p> <ul style="list-style-type: none"> • Physicians reported greater confidence in counseling following intervention • Physician acceptability of the intervention was rated from 3.25 to 4.8 (where 1=not acceptable; 5=extremely acceptable)
Smith et al., 2000	<p><u>Participants</u> N= 1142 <u>M Age</u>= 43 yrs Random allocation to one of two intervention groups: 1. <u>Prescription</u> n= 380, (58% female) 2. <u>Prescription + booklets</u> n= 376, (62% female) 3. <u>Control</u> n= 386 (61% female) <u>GPs</u> N= 55 (27 practices)</p>	<p><u>1. Prescription:</u></p> <ul style="list-style-type: none"> • GPs provided brief PA advice and written prescription according to what they thought was appropriate (blinded to baseline measures) <p><u>2. Prescription + booklets:</u></p> <ul style="list-style-type: none"> • Above plus a mailed, stage-matched self-help booklet two weeks following appointment <p><u>3. Control group:</u></p> <ul style="list-style-type: none"> • Control conducted 2 wks before intervention 	<p><u>6-10-wk follow-up:</u></p> <ul style="list-style-type: none"> • Total PA increased by at least 60 min/wk in group 2 (+35.7%) than control participants (29.1%; OR: 1.32, 95% CI 0.96-1.82) • Prescription alone was not found to be effective. <p><u>7-8 mo follow-up:</u></p> <ul style="list-style-type: none"> • No significant differences

Table 3
Summary of Primary Care Randomized Controlled Trials

Study	Design	Characteristics of Intervention	Outcomes
Elley et al., 2003	<p><u>Participants</u> N= 878 <u>M Age</u>= 57 yrs <u>Gender</u>= 66% female Cluster RCT by practice: 1. <u>Green Prescription</u> n= 451 2. <u>Usual Care</u> n= 427 <u>GPs</u> N= 117 (42 practices)</p>	<p>1. <u>Green Prescription</u>: • Patients used a form with their stage of change to prompt GP to provide written goals and prescription • A local sports foundation provided quarterly newsletters and 3 phone calls over 3-months 2. <u>Usual Care</u></p>	<p><u>12-mo follow-up</u>: • Energy expenditure (9.4 kcal/kg/wk; p=0.001) and leisure exercise (34 min/wk); p=0.04) increased in intervention group. • Self-rated general health, vitality and bodily pain improved significantly more than in control participants (p<0.05).</p>
Kerse et al., 2005	<p><u>Participants</u> N= 270 <u>M Age</u>= 72 yrs <u>Gender</u>= 63% female Computer generated randomization: 1. <u>Green Prescription</u> n= 130 2. <u>Usual Care</u> n= 140 <u>PCPs</u> N=117 (42 practices)</p>	<p>1. <u>Green Prescription</u> (see Elley, et al., 2003). • Patients used a form with their stage of change to prompt GP to provide written goals and prescription • A local sports foundation provided quarterly newsletters and 3 phone calls over 3-months 2. <u>Usual Care</u></p>	<p><u>12-mo follow-up</u>: • In intervention participants, leisure time PA increased by 0.67 h/wk in (95% CI: 0.17-1.17) and leisure time energy expenditure increased 2.67 kcal/kg/wk (95% CI: 0.87-4.47) • Self-rated general health (95% CI 1.69-9.24) also improved in intervention participants</p>
Goldstein et al., 1999	<p><u>Participants</u> N= 355 <u>M Age</u>= 65 yrs <u>Gender</u>= 65% female Randomized by practice: 1. <u>Intervention</u> n= 181 2. <u>Control</u> n= 174 <u>Physicians</u> N= 34 (24 practices)</p>	<p><i>Physically Active for Life</i> (see Pinto et al., 1998) 1. <u>Intervention</u>: • 5-min PA counseling matched to patients' stage of readiness, written prescription, and patient manual • Free follow-up appt with physician (counseling and new prescription), poster of adoption and maintenance tips, and 5 monthly newsletter mailings 2. <u>Standard care</u></p>	<p><u>6-wk follow-up</u>: • Group 1 participants (89%) were more likely to be in an advanced stage of readiness than control (74%; p<0.001), but no difference in meeting PA recommendations. <u>8-mo follow-up</u>: • No differences between groups</p>

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Graham-Clarke & Oldenburg, 1994	<p><u>Participants</u> n= 758 (at least 1 risk factor for CVD) <u>M Age</u>= 52 <u>Gender</u>= 49% female Randomized by practice: 1. <u>Video</u> n= 270 2. <u>Video + Self-help</u> n= 233 3. <u>Routine Care</u> n= 255 GPs N= 80 (75 practices)</p>	<p><i>Fresh Start Program:</i> multiple risk factor intervention to reduce CVD risk factors 1. <u>Video Intervention:</u></p> <ul style="list-style-type: none"> Following assessment for CVD and feedback, physicians offered the Fresh Start Program tailored to patient using risk factor profile. Program includes 4 lifestyle videos (introduction to program, smoking, eating, physical activity) to be seen by patients. <p>2. <u>Video + Self-help:</u></p> <ul style="list-style-type: none"> Above with the provision of 3 booklets targeting risk factor behaviors <p>3. <u>Routine Care:</u></p> <ul style="list-style-type: none"> Assessment for CVD and feedback 	<p><u>12-mo follow-up:</u></p> <ul style="list-style-type: none"> No significant difference in self-reported PA between groups, from baseline, or as a function of stage of change. Intervention appeared to lead to an intention to change in approximately 20% of intervention patients compared to routine care (p=0.023).
Grandes et al., 2009	<p><u>Participants</u> N= 4317 <u>M Age</u>= 50 yrs <u>Gender</u>= 65% female Cluster RCT by practice: 1. <u>Intervention</u> n= 2248 2. <u>Control</u> n= 2069 PCPs N= 56 (13 practices)</p>	<p>1. <u>Intervention:</u></p> <ul style="list-style-type: none"> Brief 15-min advice using software to elicit patient beliefs about PA. If patients indicated readiness to increase PA, an individualized prescription was provided along with a 4-page pamphlet summarizing all information. <p>2. <u>Control</u></p>	<p><u>6-mo follow-up:</u></p> <ul style="list-style-type: none"> Intervention patients increased PA on average by 18 min/wk (95% CI: 6-31 min/wk) compared to control patients. Subgroup analyses found that patients aged 50 and older increased more PA on average of 34.5 min/wk (95% CI: 18.4-50.6 min/wk).
Harland et al., 1999	<p><u>Participants</u> N= 523 <u>Age</u>= 40-64 yrs <u>Gender</u>= NR Randomized in blocks of 10: 1: <u>Brief intervention 1</u> n= 105 2: <u>Brief intervention 2</u> n= 105 3: <u>Intensive intervention 3</u> n= 104 4: <u>Intensive intervention 4</u> n= 102</p>	<p>1. <u>Brief intervention 1:</u></p> <ul style="list-style-type: none"> General PA information plus 1 motivational interview (~40 min) based on stage of change <p>2. <u>Brief intervention 2:</u></p> <ul style="list-style-type: none"> Above plus 30 vouchers (1 voucher= one episode of aerobic activity at local PA center during intervention time period) 	<p><u>12-wk follow-up:</u></p> <ul style="list-style-type: none"> Proportion of PA (p=0.001), moderate PA (p=0.002), and vigorous PA (p=0.001) increased significantly more in intervention groups compared with controls. No significant effect due to interviews (p=0.80), vouchers

	<p>5: <u>Control</u> n= 103 GPs N=NR (1 practice)</p>	<p>3. <u>Intensive intervention 3</u>: <ul style="list-style-type: none"> • General PA information plus 6 motivational interviews over 12-wks </p> <p>4. <u>Intensive intervention 4</u>: <ul style="list-style-type: none"> • Same as intensive intervention 3 plus 30 vouchers </p> <p>5. <u>Control</u>: <ul style="list-style-type: none"> • General information on benefits of PA and 19 leaflets on locally available leisure facilities and activities. </p>	<p>(p=0.27), or interaction between (p=0.16). <u>1-yr follow-up</u>: <ul style="list-style-type: none"> • No sustained effects of interventions. </p>
Hillsdon et al., 2002	<p><u>Participants</u> N= 1658 <u>M Age</u>= 55 yrs <u>Gender</u>= 51% female Randomized to: 1. <u>Direct advice</u> n= 544 2. <u>Brief negotiation</u> n= 551 3. <u>Control</u> n= 563 <u>Physicians</u> N=NR (2 medical centres)</p>	<p>1. <u>Direct Advice</u>: <ul style="list-style-type: none"> • Patients were told about PA benefits and advised to work towards 30 minutes of brisk walking 5x/wk </p> <p>2. <u>Brief Negotiation</u>: <ul style="list-style-type: none"> • 30-min of motivational interviewing using six strategies (ex. comparison of current PA to recommendations, pros and cons of increased PA) tailored to stage of change. Absence of advice about need to increase PA </p> <p>3. <u>Control</u></p>	<p><u>11-mo follow-up</u>: <ul style="list-style-type: none"> • Brief negotiation participants increased PA by more (+14 min/wk) than direct advice (+6 min/wk) • Brief negotiation increased PA by 24% more than control (p<0.01). • Diastolic blood pressure decreased significantly more in brief negotiation participants 3 (-2.5 mmHg) than direct advice participants 2 (-0.2 mmHg; p<0.01). </p>
Jimmy & Martin, 2005	<p><u>Participants</u> N= 161 (only those in stage of change 1-3) <u>M Age</u>= 49 yrs <u>Gender</u>= 57% female Randomized to: 1. <u>Feedback Group</u> n= 92 2. <u>Advice Plus Group</u> n= 69 <u>Physicians</u> N= 5</p>	<p>1. <u>Feedback Group</u>: <ul style="list-style-type: none"> • Physicians evaluated questionnaire responses and gave feedback relevant to current stage of change </p> <p>2. <u>Advice Plus Group</u>: <ul style="list-style-type: none"> • Above plus a stage specific handout hand out on immediate and long-term benefits of physical and ways of integrating PA into daily life. Also offered a 45-minute counselling session with PA specialist </p>	<p><u>7-wk phone follow-up</u>: <ul style="list-style-type: none"> • Approximately 35% of participants in both groups were considered active (p=0.69) • 60% of the Advice Plus group who chose counseling were classified as active </p> <p><u>14-mo follow-up</u>: <ul style="list-style-type: none"> • Approximately 40% of participants in both groups </p>

			remained inactive
			<ul style="list-style-type: none"> 71% of the Advice Plus group who chose to attend counseling were classified as active.
Norris et al., 2000	<p><u>Participants N</u>= 812 <u>M Age</u>= 54 yrs <u>Gender</u>= 52% female Randomized by practice:</p> <ol style="list-style-type: none"> <u>Intervention n</u>= 384 <u>Enhanced Intervention n</u>=1/3 of group 1 <u>Control n</u>= 463 <p><u>Physicians N</u>=32 (3 practices)</p>	<p><i>Modified PACE protocol</i> (Calfas et al., 1996)</p> <ol style="list-style-type: none"> <u>Intervention</u>: <ul style="list-style-type: none"> Physician counseled using stage of change PACE protocol including benefits of activity, dealing with barriers, and written PA prescription Booster call at 1-mo by research assistant <u>Enhanced</u>: <ul style="list-style-type: none"> Above plus booster calls and postcards at 2, 3, 4, and 5 months <u>Usual care</u> 	<p><u>6-mo follow-up</u>:</p> <ul style="list-style-type: none"> No difference between groups in PA or energy expenditure. Baseline levels of PA (61% of participants exercised at least 3x/wk) and PA counseling (48% of participants reported receiving PA counseling over the 6-mo study)
Petrella et al., 2003	<p><u>Participants N</u>= 241 (community dwelling participants) <u>M Age</u>= 73±6 yrs <u>Gender</u>= 48% female Randomized and then scheduled to meet with a corresponding physician:</p> <ol style="list-style-type: none"> <u>STEP Intervention n</u>= 131 <u>Control n</u>= 110 <p><u>Physicians N</u>= 16 (4 clinics)</p>	<p><i>Step Test Exercise Prescription (STEP) Project</i></p> <ol style="list-style-type: none"> <u>Intervention</u>: <ul style="list-style-type: none"> Physicians administered the step test (20 times up and down on a 9.5 cm step) to calculate VO₂max. Control included provision of exercise examples and application of the ACSM guidelines, and how to determine heart rate for intensity purposes. <u>Control</u>: <ul style="list-style-type: none"> Usual care in addition to exercise counseling including ACSM guidelines and benefits of exercise 	<p><u>6-mo follow-up</u>:</p> <ul style="list-style-type: none"> VO₂max increased more in intervention participants (11% than control (4%)) <p><u>12-mo follow-up</u>:</p> <ul style="list-style-type: none"> Intervention participants had significantly higher exercise self-efficacy compared to group 1 (6.8 vs. 4.6; p<0.001) and from baseline to follow-up (4.2 vs. 5.4; p<0.05). Intervention participants also reduced systolic blood pressure (-9 mmHg; p<0.002) and a 7.4% decrease in BMI (p<0.05).
Pfeiffer, Clay, & Conatser,	<p><u>Participants N</u>= 49 <u>M Age</u>= 74±1 yrs <u>Gender</u>= 90% female</p>	<ol style="list-style-type: none"> <u>Verbal advice</u>: <ul style="list-style-type: none"> PA provided through questionnaire, 5 min PA advice, and goal setting 	<p><u>6-wk telephone follow-up</u>:</p> <ul style="list-style-type: none"> PA increased significantly in both groups, from 32% to 68% in

2001	<p>Random assignment:</p> <ol style="list-style-type: none"> 1. <u>Verbal advice</u> n= 25 2. <u>Green Prescription</u> n= 24 <p>Geriatricians N=3 (1 practice)</p>	<p>2. <u>Green Prescription</u>:</p> <ul style="list-style-type: none"> • Above plus written goals 	<p>verbal advice group and from 36% to 65% in green prescription group</p> <ul style="list-style-type: none"> • There were no significant differences between groups.
Pinto et al., 1998	<p><u>Participants</u> N= 355 <u>M Age</u>= 66 yrs <u>Gender</u>= 65% female Randomized by practice:</p> <ol style="list-style-type: none"> 1. <u>Intervention</u> n= 174 2. <u>Control</u> n= 181 <p><u>Physicians</u> N= 34 (24 practices)</p> <ol style="list-style-type: none"> 1: <u>Control</u> n= 12 2: <u>Intervention</u> n= 12 	<p><i>Physically Active for Life</i> (see Goldstein et al., 1999)</p> <p>1. <u>Intervention</u>:</p> <ul style="list-style-type: none"> • Interviewed for stage of change, history of and barriers to PA plus brief counseling, exercise prescription, and patient manual specific to stage of readiness • Additional copy of manual and 3 newsletters mailed over 4-months. <p>2. <u>Control</u>:</p>	<p><u>6-wk and 8-mo follow-up</u>:</p> <ul style="list-style-type: none"> • Physicians rated the program favorably and would recommend program to colleagues. • Barriers included insufficient time and forgetting to counsel. • Confidence in counseling was significantly higher in physicians providing the intervention. • Intervention patients rated prescription as moderately useful.
Swinburn et al., 1998	<p><u>Participants</u> N= 456 <u>M Age</u>= 49 yrs <u>Gender</u>= 62% female Physician recruited participants based on perceived benefit of PA; after verbal advice, participants randomized:</p> <ol style="list-style-type: none"> 1. <u>Verbal advice</u> n= 238 (64% female) 2. <u>Green prescription</u> n= 218 (59% female) <p>*No control group <u>Physicians</u> N= 37 (2 centers)</p>	<p>1. <u>Verbal Advice</u>:</p> <ul style="list-style-type: none"> • PA assessed through questionnaire, physician provided 5 min PA advice and a PA goal <p>2. <u>Green Prescription</u>:</p> <ul style="list-style-type: none"> • Verbal advice plus written prescription (i.e. goals recorded) 	<p><u>6-wk telephone follow-up</u>:</p> <ul style="list-style-type: none"> • 2-wk PA recall questionnaire revealed more green prescription participants increased PA more than those receiving verbal advice only.

<p>Writing Group for the Activity Counseling Trial Research Group, 2001</p>	<p><u>Participants N</u>= 874 <u>M Age</u>= 52 yrs <u>Gender</u>= 45% female Computer-automated randomization: 1: Advice n= 292 2: Assistance n= 293 3: Counseling n= 289 *No true control group <u>Physicians N</u>= 51 (11 practices) Physician Assistants n= 2 Nurse Practitioners n= 1</p>	<p><i>Activity Counseling Trial</i></p> <p>1. <u>Advice</u>:</p> <ul style="list-style-type: none"> • Physician advice (2-4 min) on PA recommendations • Health educator provided information on type and amount of PA, but no additional counseling <p>2. <u>Assist</u>:</p> <ul style="list-style-type: none"> • Advice plus additional 30-40 minutes of health educator advice, including counseling, a video, monthly newsletters, referrals to community resources, and brief occasional telephone contact <p>3. <u>Counseling</u>:</p> <ul style="list-style-type: none"> • Assist plus regular phone, in-clinic follow-up counseling, and weekly behavior change classes. 	<p><u>24-mo follow-up</u>:</p> <ul style="list-style-type: none"> • VO₂max higher for females in assist and counseling groups compared to advice. • No difference in cardiorespiratory fitness or PA for men between any of the groups • No significant differences in 7-day physical activity recall. • Cost was approximately \$500 for each participant in assist group and \$1100 for each participant in counseling group.
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Chapter 3

METHODS

Overview of Study I

Research objectives for this study included determination of the prevalence of PA counseling, perceived knowledge and confidence in counseling PA, educational training related to PA counseling, and whether differences exist for these factors between NPs and physician assistants. This study used a cross-sectional design. The Promotion of Physical Activity and Health Practitioner Questionnaire (PPAHQ) which examines the PA knowledge, training and counseling practices of NPs and physician assistants was completed either online through Survey Monkey or as a paper copy. Outcomes included the percentage of NPs and physician assistants providing PA counseling; self-reported knowledge and confidence in ability to counsel PA; and the type of educational training related to PA counseling and where this information was received.

Participants and Recruitment

Study participants (n=318) were employed NPs and physician assistants. Inclusion criteria for this study included: (1) being a licensed NP or physician assistant currently practicing in a facility where PA counseling would be appropriate and applicable and (2) ability to read and write in English. Questionnaires completed by participants who were not currently practicing as an NP or physician assistant (n=30) were excluded from analysis.

Recruitment occurred in person and through email from local Arizona hospitals and clinics, the Arizona Nurses Association, the Arizona State

Association of Physician Assistants, and other nursing and physician assistant organizations (e.g. Arizona Nurse Practitioner Council) located in Arizona. Emails were sent through Arizona NP- and physician assistant- associated listservs to approximately 1000 active NPs and 300 physician assistants describing the purpose of the study, requirements for participation and a link to an encrypted online version of the survey (see Appendix A). A total of 365 surveys were returned, of which 15 were incomplete. Complete surveys were collected from 240 NPs and 78 physician assistants. The majority (60%) of surveys were completed in person; 52.3% at the American Academy of Nursing Practitioner meeting and 7.7% at the state Association of Physician Assistant meetings. The response rates for surveys completed at the State Association of Physician Assistant meeting and the American Academy of Nurse Practitioners meeting were 37.3% and 52%, respectively. The overall response rate cannot be calculated due to a snowball effect resulting from recruitment conducted through electronic sources (e.g. organization and hospital emails). Participants were entered into a drawing for the chance to win one of four \$50 gift cards as a participation incentive.

Measures

The Promotion of Physical Activity by Health Practitioners Questionnaire (PPAHQ) is a modified version of the Promotion of Physical Activity by Nurse Practitioners Questionnaire (Buchholz & Purath, 2007; Burns et al., 2000). The original survey, Promotion of Physical Activity by Nurse Practitioners, was reviewed by experts for face validity and an examination of 1- month test-retest

reliability indicated that the average percent of agreement between the two administrations of the surveys was 86% for categorical and interval response (Burns et al., 2000). In its original form, the survey consisted of 5 sections that included demographic data, practice patterns related to PA promotion, methods used to assess and counsel, barriers to counseling, knowledge and confidence for assessing and counseling, how and where knowledge of PA promotion was obtained, and lastly the respondents own PA level (Burns et al., 2000).

Buchholz & Purath (2007) expanded upon the questionnaire by Burns and colleagues (2000) to include questions related to familiarity and use of several fitness measures (e.g. cardiorespiratory fitness, muscular strength, flexibility, body composition, and balance) by NPs in their practice. Additionally, Buchholz & Purath (2007) defined PA and physical fitness at the beginning of the questionnaire. Again, the questionnaire was reviewed and pilot tested prior to final administration.

In the present study, the PPAHQ consists of six sections, similar to the questionnaire used by Buchholz & Purath (2007). Questionnaire wording was modified slightly (e.g. nurse practitioner was changed to healthcare provider) to include physician assistants. Two questions were added to examine respondent interest in obtaining PA counseling training, and to rank the delivery method of such training (e.g. online curriculum, online curriculum through continuing education credit only, university courses online or in person, in-service education, and workshop at professional conference). Responses were specified through 5-point Likert-scale, multiple-choice, and fill-in-the-blank questions (see Appendix

A). This questionnaire took approximately twenty minutes for participants to complete.

Data Analysis

Descriptive statistics characterized the study sample, including identification of a mean and standard deviation of respondents' ages, percentage of each gender, years of practice within occupation, practice locale (e.g. suburban, rural, urban), and type of facility (e.g. private practice, outpatient clinic, hospital, etc) stratified by occupation (NP or physician assistant). All statistics were completed using SPSS (PASW Statistics, Version 18.0.0, SPSS Institute Inc., 2010, Chicago, IL).

Null hypotheses were maintained for Study 1 research hypotheses. Little is known regarding PA assessment and counseling practices, knowledge and confidence, or PA counseling educational training among physician assistants. Thus, it cannot be reasonably assumed that one group, NPs or physician assistants, would be significantly different from the other group. Chi-square tests for independence and Mann-Whitney U tests were performed to evaluate the hypotheses. The independent value for each analysis was occupation group, NP or physician assistant.

The first hypothesis, that there will be no significant difference in PA counseling practices between NPs and physician assistant, was examined with a chi-square for independence test. Specifically, the test determined if there was a difference in the proportion of NPs and physician assistants who self-reported

routine counseling of primary care clients to accumulate 30 minutes of moderate intensity physical activity on most days of the week (yes/no).

The second hypothesis, that there will be no significant difference in knowledge to provide PA counseling between NPs and physician assistants was also examined with chi-square analysis. The following question was utilized to elicit participant response “On a scale of 1 to 5, 1 indicating the least amount of the attribute and 5 indicating the most amount of the attribute, please rate the following: Your knowledge about counseling clients about physical activity.” The third hypothesis, that there will be no significant difference in confidence to provide PA counseling, was assessed in the same manner as hypothesis 2. The same question was applied to participant confidence with the dependent variable of these analyses being the choice of one of the five categorical options.

The fourth hypothesis, that there will be no significant differences in educational training to provide PA counseling was examined using four questions from the PPAHQ. The questionnaire asked participants to respond with a yes or no to the following question, “Did you receive preparation in the areas of physical activity in the educational program that prepared you to be a health practitioner (e.g. nurse practitioner or physician assistant)?” For participants responding yes, a follow-up question asked, “If yes, which of the following did you receive preparation about? Please check all that apply.” Participants were directed to choose as many options from a list including the health benefits of physical activity, the physiology of physical activity, the type or mode of physical activity to advice, the intensity of physical activity to advice, the intensity of physical

activity to advise, use of rating of perceived exertion, to gauge intensity, use of maximum heart rate to gauge intensity, the duration of physical activity to advise, and the frequency of physical activity to advise. Additional chi-square tests were run for each of these options.

A second question regarding educational training was asked, “Have you had any other educational preparation in the area of physical activity prescription?” with a response of yes or no. For those answering yes, a follow-up question asked, “If yes, where did you receive this preparation?” Participants were directed to choose as many options from a list including baccalaureate nursing program, baccalaureate physician assistant program, master’s program, additional coursework, conference(s), workshop(s), seminar(s), self-study or other. Additional chi-square tests were run for each of these options.

Overview of Study II

This second study further examined the knowledge of, attitudes toward, confidence in, and practices of PA counseling in NPs and physician assistants using qualitative research methods. As stated previously, current knowledge of, attitudes toward, confidence in, and practices of PA counseling in these populations are poorly understood. Qualitative methodology will aid in the identification of underlying themes related to these topics that cannot be obtained through quantitative methods alone (Glaser and Strauss, 1967). This study consisted of five FGs stratified by participant profession (three NP FGs and two physician assistant FGs). A modified grounded theory approach was used to reveal themes that emerged from FG discussions.

Participants and Recruitment

FG participants (n=5-12 per group) were currently practicing NPs and physician assistants. Participant eligibility criteria included being a licensed, practicing NP or physician assistant currently practicing in a facility where PA counseling would be appropriate and applicable, willingness to participate, ability to read and write in English, and provision of informed consent to participate.

Participants were recruited in person and through email from local Arizona hospitals and clinics, the Arizona Nurses Association, the Arizona State Association of Physician Assistants, and other nursing and physician assistants organizations (e.g. Arizona Nurse Practitioner Council) located in Arizona. Emails describing the purpose of the study and the requirements for participation were sent through Arizona NP and physician assistant- associated listservs to approximately 1200 active NPs, and 550 physician assistants (see Appendix B). In-person recruitment also occurred during local organization meetings (e.g. Arizona Nurse Practitioner Council, Arizona State Association of Physician Assistants). Individuals expressing interest in FG participation were screened in person, via telephone or by email to determine eligibility (see Appendix B).

While power cannot be calculated for qualitative studies, many of the considerations for determining sample size for qualitative studies correspond to power calculations used in quantitative research. Such considerations include the range (number of groups needed to describe the entire range of issues for the domain of interest), saturation (number of people needed before no new concepts emerge and the phenomenon is described in its entirety) and stratification (the

number of categories along a single dimension that need to be captured) (Morgan, 1998). Redundancy and range are typically achieved with a sample size of 30. Moreover, five people is considered the standard minimum and 12 people is considered the standard maximum in FG research (Morgan, 1998).

Data Collection and Instrumentation

FGs were held at convenient locations for participants and included the Arizona State University Downtown campus, local hospitals and clinics. Participants were required to provide their own transportation to and from the FGs. Refreshments were served including bottled water, fruit, and vegetable trays. A trained moderator with experience in conducting FGs led all of the FGs with a standard moderator's guide. At the start of each FG, the moderator introduced herself and described the purpose and guidelines of the FG to the participants. Participants were then asked to read and sign the information letters. FG discussions lasted approximately 90 minutes and were audio-taped after each participant's consent was obtained.

FG recordings were transcribed verbatim following each group. A note-taker was also present at each FG to serve as a back up to the audio-recorder. All transcripts were verified for accuracy and the participants name were removed and replaced with id numbers to ensure confidentiality. Participants were also asked not to repeat any specific comments stated during the FG to respect all participants' confidentiality.

As stated previously, a standard prepared moderator's guide was used to lead the FG discussions (see Appendix B). The moderator's guide was created

following a literature review of the efficacy and effectiveness of HCP interventions and cross-sectional surveys of PA counseling by HCPs. Moderator guide questions were generated to address gaps in knowledge regarding PA counseling knowledge, confidence, practices and educational training among NPs and physician assistants. Additionally, an expert in qualitative research and a NP reviewed and provided input on the moderators guide prior to use.

As a result of this literature review, ten main topics of interest with several follow-up questions and/or probes were used to generate dialogue among FG participants (see Appendix B). Basic descriptions of the ten focus areas are provided below:

1. How do the personal PA habits of the NPs and physician assistants impact health and PA counseling?
2. How does the topic of PA come up for discussion during the patient encounter? Specifically we examined who typically initiates the conversation, the types of questions asked by both the healthcare provider and his or her patients, and what types of questions, if any, do providers feel they are unable to answer, and how they handle these questions (e.g. do they find the answers out, if so, from where, and how?).
3. What are the PA counseling practices of NPs and physician assistants? Specifically, how often they provide PA counseling, their self-perceived strengths and weaknesses regarding provision of counseling,

and what patient characteristics, if any, would prompt PA counseling by providers were examined.

4. How do NPs and physician assistants describe their level of comfort with and confidence in counseling patients on PA.
5. How do organizational characteristics in the NPs' or physician assistants' place of employment influence PA counseling practices?
6. From where do the NPs and physician assistants obtain their knowledge about physical activity and the information on PA that they provide to their patients?
7. How familiar are NPs and physician assistants with national PA guidelines including the 2007 ACSM and American Heart Association PA guidelines and the 2008 Surgeon General's PA Guidelines for America. What do the NPs and physician assistants know about the ACSM Exercise is Medicine initiative and do they find its' materials useful?

To do this, the moderator provided a 7-page (double-sided) packet entitled the Exercise is Medicine Health Providers Guide during the FGs (see Appendix B). These toolkits provided a review on how to use the guide/toolkit, an exercise prescription and referral form, starting an exercise program patient handout, exercise and readiness prescription pad, information on the prescription for health flier series (for patients with chronic health conditions), and an office flier to be displayed in waiting room/patient rooms, etc. (ExerciseIsMedicine.org., n.d.). Follow-up questions included determining the perceived usefulness of an action

guide or toolkit such as this, and if any further information would be needed to implement use with patients.

8. What types of information and materials do physician assistants and the NPs find useful and helpful for providing PA counseling to their patients?
9. What are the best channels of communication or methods for disseminating information about physical activity and PA counseling to NPs and physician assistants?

FG participants were also asked to complete the PPAHQ (see Appendix A) as a measure to obtain participant characteristics. For more information regarding the creation of the PPAHQ please refer to page 66 in chapter 4. This questionnaire was completed immediately prior to each FG discussion, after information letters were signed, and took approximately fifteen to twenty minutes participants to finish. FG discussions ended with the moderator asking participants if there were any points regarding PA counseling they would like to include that had not yet been addressed. After each FG ended, each participant received one \$15 Target gift card as an honorarium for participation. A receipt of this gift card was signed by each participant and a witness.

Data Analysis

The PPAHQ was used to obtain descriptive data regarding the study population. Descriptive statistics were utilized to characterize the study sample, including identification of a mean and standard deviation of respondent's ages, percentage of each gender, years of practice within occupation, practice locale

(e.g. suburban, rural, urban), and type of facility (e.g. private practice, outpatient clinic, hospital, etc) stratified by occupation (NP or physician assistant).

A modified grounded theory approach was used for the qualitative analysis (Lincoln & Guba, 1985; Strauss & Corbin, 1990). Grounded theory refers to a method of theory formation derived from gathered and analyzed qualitative data using an inductive approach (Strauss & Corbin, 1990). The research begins with an area of research and allows a theory to emerge from the data through a rigorous and structured analysis process rather than beginning with preconceived theories or hypotheses. Grounded theory enables a researcher to gain insight into thought processes, feelings and emotions that are challenging to obtain from more traditional, quantitative research methods. It allows for a more in-depth understanding of the concept studied.

The constant comparison method is at the core of Grounded Theory (Strauss & Corbin, 1990). The first stage of the constant comparison method involves the coding of incidents, or units, of information for the purpose of categorization (Lincoln & Guba, 1985). Units are concepts or small pieces of information that can be used for interpretation without the aid of other information (Lincoln & Guba, 1985). FG discussions, upon transcription, were analyzed with a line-by-line microanalysis. Initially, data was reviewed multiple times and units were selected based upon an intuitive approach of what “feels right” or “looks right” (Lincoln & Guba, 1985). As each unit was discerned, it was compared to previously identified units. This describes the coding process and the first stage of the constant comparison method. Selection and comparison

of units allows for the theoretical properties of the category begin to emerge.

Verified transcripts were entered into NVIVO to facilitate analyses. NVIVO is a software package that is used to organize and manage qualitative databases (QSR International, n.d.).

The second stage of the constant comparison methodology consists of using definitional and inclusion properties as stated above to shift comparison from an intuitive approach to a more precise approach (Lincoln & Guba, 1985). Comparison between units continued until fewer and fewer units fit into the already defined categories. Data that do not appear to fit into any category were retained for further review later. Finally, the categories were examined and compared to determine possible relationships among them. As stated previously this study follows a modified grounded theory approach. A theory will not be generated; however, the constant comparison method was followed to allow for thematic analysis of data that was utilized to make comparisons between themes among NPs and physician assistants.

Chapter 4

NURSE PRACTITIONER AND PHYSICIAN ASSISTANT PHYSICAL ACTIVITY COUNSELING KNOWLEDGE, CONFIDENCE AND PRACTICES

Abstract

This exploratory cross-sectional study examined NPs and physician assistants' perceptions about their current PA counseling practices. Participants were currently practicing NPs (n=240) and physician assistants (n=78) primarily in Arizona, USA during 2010. Participants completed a modified version of the Promotion of Physical Activity by Nurse Practitioners Questionnaire either online or in person during a practitioner specific conference. Mann-Whitney U tests and Chi-Square analyses examined differences between NPs and physician assistants. NP respondents were older (48.3 vs 39.8 yrs, $p<0.001$) and more likely to be female (94% vs 76%; $p<0.001$) compared to physician assistants. The majority of respondents (NPs: 75%; physician assistants: 64%; $p<0.07$) reported routinely counseling patients about PA. There were no differences in perceived knowledge ($p=0.10$) or confidence ($p=0.75$) to provide PA counseling between NPs and physician assistants. Approximately half of all respondents reported receiving training to provide PA counseling as part of their educational preparation for becoming a health practitioner ($p=0.18$). Study results indicate that while NPs and physician assistants are knowledgeable, confident and currently providing some level of PA counseling to patients, the majority of respondents are interested in receiving additional training to aid in providing PA counseling.

Introduction

While the health benefits of physical activity are well established (USDHHS, 1996), only 47% of the adult U.S. population meets the recommended levels of PA (CDC, 2007). Counseling by PCPs is an essential component for increasing PA behavior (Calfas et al., 1996; Grandes et al., 2009; Lawlor & Hanratty, 2001; Lewis & Lynch, 1993; Pinto, Goldstein, and Marcus, 1998). In 2007, the ACSM endorsed an initiative entitled “Exercise is Medicine” that calls for making PA assessment and prescription a standard part of disease prevention and treatment (Sallis, 2009). It is clear that medical professionals are a respected source of information, and as fewer physicians select primary care as their specialty, NPs and physician assistants’ are being utilized more frequently as PCPs (Buchholz & Purath, 2007; Everett et al., 2009; Hooker, 2006). In 2009, there were approximately 125,000 practicing NPs in the U.S. undertaking nearly 600 million visits yearly (AANP, n.d.), with approximately 85% of NPs in primary care (Everett et al., 2009; Hooker, 2006). An estimated 74,000 physician assistants worked in clinical care practice in the U. S. (AAPA, 2008), with an estimated 50% of physician assistants in primary care (Everett et al., 2009). Furthermore, the Institute of Medicine of the National Academies (IOM) (2008) has identified the importance of utilizing interdisciplinary teams of diverse health care providers to enhance competence and innovation in providing superior healthcare. NPs and physician assistants are important members of the healthcare system. As they are becoming more prevalent as PCPs, it is important to understand their knowledge and practices regarding PA counseling. While it has

been reported that approximately 30% of NPs question their patients about PA participation, only 14% provide any PA counseling (Burns et al., 2000), and the percentage of physician assistants that assesses or provide PA counseling is unknown.

The efficacy and effectiveness of PA counseling in primary care has been evaluated through quasi-experimental and randomized trials. Typically, these interventions have included screening of patients within the waiting room, followed by brief PA counseling (verbal and sometimes written materials) by physicians (primarily) and non-physician clinicians, such as NPs. Patient follow-up has varied from 4-weeks to 12-months and included additional physician visits, telephone calls, and/or mailings. Successful primary care interventions often provided intervention components (e.g., written prescription, newsletters) beyond brief counseling. (Calfas et al., 1996; Elley et al., 2003; Grandes et al., 2009; Harland et al., 1999; Kerse et al., 2005; Smith et al., 2000). However, this type of approach may be considered too intensive for physicians seeing patients regularly (Tulloch et al., 2006). Additionally, some interventions featured advice delivered by a physician, with PA assessment by a nurse or other office staff (Eden et al., 2002; Goldstein et al., 1998; Grandes et al., 2009; Norris et al., 2000; Smith et al., 2000). Therefore, PA assessment and counseling delivered by other health providers, such as NPs and physician assistants, is worth consideration.

Surveys of PCPs suggest that the primary barriers to PA counseling include lack of time, the need to address more important issues, and insufficient educational materials (Buchholz & Purath, 2007; Bull et al., 1995; Burns et al.,

1995; Lawlor et al., 1999; Rogers et al., 2002; Sherman & Hershman, 1993). Such evidence reinforces the potential usefulness of non-physician clinicians, such as NPs and physician assistants, as PA promoters in primary care. Tulloch and colleagues (2006) suggest that this population may be better suited for providing PA counseling due to an increased ability to provide a more intensive intervention.

The current limited body of literature suggests positive attitudes and confidence of NPs to provide PA counseling; however, to date there is no published data about PA counseling by physician assistants. Therefore, this study sought to examine: (1) the prevalence of PA assessment and counseling practices; (2) perceived knowledge and confidence in counseling PA; (3) educational training related to PA counseling; and (4) potential differences in these factors between NPs and physician assistants.

Methods

Design

Cross-sectional data were obtained to examine PA counseling practices, self-reported knowledge and confidence to provide PA counseling, and the type and source of educational training related to PA counseling in both NPs and physician assistants. The Arizona State University Institutional Review Board approved this study (see Appendix A) and research was conducted according to these guidelines.

Participants

Inclusion criteria for this study included being a licensed NP or physician assistant with the ability to read and write in English and currently practicing in a facility where PA counseling would be appropriate. According to the Arizona State Board of Nursing in 2011, there were approximately 3,555 NPs in Arizona. In 2010, there were approximately 1,662 practicing physician assistants in Arizona (Kaiser Family StateHealthFacts.org, 2010). An email describing the study participation requirements and a link to an encrypted online version of the survey was sent to approximately 1,000 active NPs and 300 physician assistants through Arizona NP- and physician assistant- associated listservs. Additionally, the study was advertised in-person at local organization meetings (e.g. Arizona State Association of Physician Assistants and the American Academy of Nurse Practitioners). There were 365 surveys returned of which; 47 were excluded: 15 were incomplete, 30 were completed by participants not currently practicing as NPs or physicians assistants, and 2 did not indicate credentials (NP or physician assistant). Complete surveys were collected from 240 NPs and 78 physician assistants. The majority (60%) of surveys were completed in person; 52 % at the 2010 American Academy of Nursing Practitioner meeting and 8% at the 2010 Arizona Association of Physician Assistant meetings. The response rates for surveys completed at these meetings were 52% and 37%, respectively. The overall response rate was not calculated due to a snowball sampling effect that resulted from recruitment conducted through electronic sources (e.g. organization and hospital emails). Participants were entered into a drawing for the chance to win one of four \$50 gift cards as a participation incentive.

Measures

Participants completed a modified version of the Promotion of Physical Activity by Nurse Practitioners Questionnaire (PPANQ) (Buchholz & Purath, 2007; Burns et al., 2000). The original PPANQ consisted of five sections including demographics, practice description, practice patterns, knowledge and confidence to provide PA counseling, and acquisition of knowledge to provide PA counseling (Burns et al., 2000). A one-month test-retest reliability indicated that the average percent of agreement between the two administrations of the PPANQ surveys was 86% (Burns et al., 2000). Buchholz & Purath (2007) modified the PPANQ to include questions related to familiarity and use of several fitness measures by NPs in practice. Additionally, definitions of PA and physical fitness were added to the beginning of the questionnaire. The questionnaire was reviewed for content validity prior to final administration. For this study, the PPANQ survey (Buchholz & Purath, 2007) wording was modified (e.g. nurse practitioner was changed to healthcare provider) to be inclusive of physician assistants. Two questions were added to examine respondent interest in obtaining PA counseling training, and to rank order the preferred training delivery methods. Responses were specified through 5-point Likert-scale, multiple-choice, and fill-in-the-blank questions (see Appendix A). This questionnaire took approximately twenty minutes for participants to complete.

Statistical Analyses

Descriptive statistics were calculated to describe participants and outcome variables. The Kolmogorov-Smirnov statistic and histograms were used to test

normality of variables. Mann-Whitney U Tests and Chi-Square tests examined differences between NP and physician assistant groups on outcome variables. All analyses were performed using SPSS (PASW Statistics, Version 18.0.0, SPSS Institute Inc., 2010, Chicago, IL) and results were considered significant if the P-value was ≤ 0.05 .

Results

Characteristics of participants (n=318) are reported in Table 4. Table 5 summarizes counseling practices, knowledge and confidence to provide PA counseling for NPs and physician. There were no significant differences ($\chi^2 (1) = 3.29, p < 0.07$) in the proportion of NPs (75%) and physician assistants (64%) who reported routinely counseling their clients to accumulate 30 minutes of moderate intensity PA on most days of the week. Further, there were no significant differences between NP and physician assistant respondents in perceived knowledge for counseling ($\chi^2 (4) = 7.98, p < 0.92$) or confidence ($\chi^2 (4) = 5.23, p < 0.26$) to provide PA counseling.

Only 48% of NPs and 58% of physician assistants ($\chi^2 (1) = 1.82, p < 0.18$) reported receiving educational preparation to counsel patients on PA during their respective health practitioner programs (Table 6). Among individuals who reported receiving information about PA during their educational programs, the topics most commonly received were: the health benefits of PA (100% of NPs and physician assistants), duration (83% of NPs; 90% of physician assistants), frequency of PA (79%; 81%), physiology of PA (66%; 64%) and type or mode of PA (58%; 50%).

Approximately 50% of NPs and physician assistants indicated that they obtained other types of educational preparation for PA counseling (47% versus 57%, respectively, $\chi^2 (1) = 0.35, p < 0.56$). Of those reporting outside preparation, the most common source of information for NPs (65%) and physician assistants (52%) was through self-study ($\chi^2 (1) = 0.07, p < 0.79$). A significantly larger proportion of NPs (59%) reported receiving PA counseling preparation through conferences, workshops, and/or seminars than physician assistants (21%; $\chi^2 (1) = 7.79, p < 0.005$). “Other” was commonly defined as preparation received during undergraduate degree (e.g. kinesiology, exercise physiology, physical education) and on the job training.

The most commonly identified counseling practices and methods of PA counseling as ranked by participants are provided in Table 7. Questioning a client about PA was the most commonly reported method of assessing PA (41% of NPs and 54% of physician assistants). Measuring height and weight and assessing general appearance were also common methods of assessment reported by participants. Discussing PA with patients was the most common method of PA counseling (90% of NPs and physician assistants), followed by provision of written materials. Three days per week and most days of the week were the two most commonly recommended PA frequencies by both NPs and physician assistants. NPs (50%) were more likely to recommend the “talk test” as their primary recommended measure of intensity for patients while physician assistants (60%) were more likely to recommend moderate intensity during a brisk walk (3-

4 mph). Walking was the most commonly prescribed PA by both NP (91%) and physician assistant respondents (90%).

Barriers to providing PA counseling were similar for each population (Table 8). The two most commonly identified barriers to counseling were lack of time (51% of NPs; 62% of physician assistants, $p=0.06$) and having more important concerns to discuss (48% of NPs; 59% of physician assistants, $p=0.96$). NPs (13%) were more likely than physician assistants (4%) to report unsafe neighborhoods as a barrier ($\chi^2 (1) = 4.99, p<0.03$). A greater proportion of physician assistants (22%) than NPs (6%) perceived PA counseling as useless due to a lack of follow through by their patients NPs ($\chi^2 (1) = 15.94, p<0.001$).

Approximately 72% of respondents (76% of NPs vs 61% of physician assistants: $\chi^2 (1) = 10.08, p<0.001$) indicated that they would like additional training in PA counseling. Of those interested in receiving training, 44% of physician assistants reported an online curriculum for continuing education credit as their number one choice. This was also the first choice of 33% of NPs. A workshop at a professional conference was the first choice of 30% of NPs and 27% of physician assistants.

Discussion

This is the first study to simultaneously examine PA counseling practices of NPs and physician assistants who serve as PCPs for a growing number of patients requiring healthcare related to sedentary behaviors. There were no significant differences between these two groups in their routine counseling practices, perceived PA counseling knowledge or confidence to counsel, or PA

training during their healthcare provider educational training. However, there were significant differences in sources accessed for additional training or information about PA counseling.

In this study, a slightly greater proportion of NP providers reported routinely counseling patients than has been shown in other survey reports. Burns and colleagues found that 58% of NP respondents reported providing routine PA counseling to patients (2002), and more recently, Buchholz and Purath (2007) showed 74% of NPs sample reported providing routine PA counseling to their patients. The similarity between NP and physician assistants' average score for counseling knowledge is consistent with other reported surveys (Burns et al, 2002; Buchholz & Purath, 2007). These findings also indicate both levels of credentialed providers having rather high self-perceptions of PA counseling knowledge. This suggests that more than half of both populations report having more knowledge to counsel. Self-reported confidence to provide PA counseling yielded similar results, with both NPs and physician assistants reporting high score of confidence in counseling similar to those found in the literature (Burns et al., 2000; Buchholz & Purath, 2007).

While there were no differences in the proportion of NPs and physician assistants who reported receiving education about PA as part of their professional training, only 51% of respondents indicated that they received this type of training. This finding is consistent with previous research studies. Buchholz and Purath (2007) reported that PA information was not part of NPs formal training. NPs primarily obtained their PA information through conferences/workshops

(43%) and self-study (37%). In another survey of primary care staff (e.g. family physicians, practice nurses; n=757), 40-60% of respondents reported that educational materials were insufficient for their needs and approximately half thought there was a lack of PA training (Douglas, Torrance, van Teijlingen, Meloni, & Kerr, 2006).

Lack of formal training and a desire by health practitioners to receive such training is important to note considering the current emphasis being placed on health providers to provide PA counseling (Garry et al., 2002; Jacobson et al., 2005; Sallis, 2009). In 2005, the American College of Preventive Medicine issued a position statement “that primary care providers should incorporate PA counseling into routine patient visits” (Jacobson et al., 2005). Other professional organizations echo this sentiment including the American Academy of Family Physicians, the American Academy of Pediatrics, the American College of Obstetrics and Gynecology, the American Heart Association, National Institutes of Health, ACSM through the Exercise is Medicine” initiative, and the Surgeon General (Garry et al., 2002; Jacobson et al., 2005; Sallis, 2009). Interestingly, in the present study approximately 72% of the respondents indicated that they would be interested in receiving additional training in PA counseling. An online curriculum for continuing education credits and training workshops at professional conferences were the most commonly suggested delivery methods for additional PA training.

In the present study, respondents reported working in a variety of medical fields. The two previous NP focused studies by Burns et al. (2000) and Buchholz

& Purath (2007) were conducted with NPs working within primary care, thus limiting comparisons. Therefore, the findings in our study and these two studies are of interest, suggesting similar practices, barriers, and needs between primary care NPs and other fields.

A limitation of this study is the use of a cross sectional study design, limiting the ability to claim causality. An additional limitation is the omission of a question regarding respondent specialty. This limits the possibility of comparing responses by specialty. While there were more NPs than physician assistants survey respondents, which may limit the ability to draw comparisons between these two populations, it should be noted that there are more practicing NPs than physician assistants. Future studies should explore similar questions by in a larger sample of physician assistants.

Conclusion

This is the first study examining the self-reported PA counseling practices of NPs and physician assistants. The results of this study indicate both a desire to provide PA counseling and some level of current PA counseling by NPs and physician assistants, with no significant differences in knowledge or confidence to provide PA counseling. While there were no significant differences in PA counseling training received by participants in their health practitioner programs, only half of our sample reported receiving such training. The information obtained as a result of this study provides important contributions not only to the literature but as a foundation for future interventions utilizing NPs and physician

assistants as PA counselors. The professional and clinical implications of these findings suggest a need for additional training for NPs and physician assistants to provide PA counseling.

Table 4
Participant Characteristics Stratified by Occupation

Variable	Total Sample (N=318)	Nurse Practitioners (n=240)	Physician Assistants (n=78)	<i>P</i>
	Median (IQR) or n (%)	Median (IQR) or n (%)	Median (IQR) or n (%)	
Age, y ^a	48 (39, 54)	50 (42, 54)	36 (31, 50)	<0.001**
Sex ^b				<0.001**
Female	n =286 (89%)	n =227 (94%)	n =58 (76%)	
Male	n =32 (10%)	n =14 (6%)	n =18 (24%)	
Years of Practice ^a	8 (3, 13)	9 (4, 14)	6 (2.8, 10)	0.02*
Practice Locale ^b				0.15
Urban	n =126 (40%)	n =97 (40%)	n =29 (38%)	
Suburban	n =108 (34%)	n =75 (31%)	n =33 (43%)	
Rural	n =77 (24%)	n =62 (26%)	n =14 (18%)	
Type of Practice Facility ^b				0.04*
Private Practice	n =119 (37%)	n =82 (35%)	n =36 (47%)	
Community Clinic	n =47 (15%)	n =37 (16%)	n =10 (13%)	
Hospital	n =63 (20%)	n =49 (20%)	n =14 (18%)	
Age of Patients ^a	45 (40, 55)	45 (40, 55)	44 (39, 55)	0.41
Percentage of Perceived Sedentary Patients ^a	50 (30, 75)	50 (30, 75)	50 (30, 70)	0.70
Percentage of Practice Spent Teaching or Counseling ^a	50 (25, 60)	50 (25, 60)	50 (25, 53)	0.71
Self-Reported PA Level ^{b, c}	3.7 ± 0.9	3.7 ± 0.9	4.0 ± 0.8	0.06

Note. IQR = interquartile range.

^aDetermined using Mann-Whitney U-test

^bDetermined using Chi-Sq test for independence

^cSelf-reported using a 1-5 Likert scale, where 1=inactive and 5=vigorously active for 30-60 minutes on most days of the week.

*Significant at the 0.05 level

** Significant at the 0.01 level

Table 5
Chi-Square Analysis of Self-Reported PA Counseling Behavior and Knowledge and Confidence to Provide PA Counseling by
Nurse Practitioners and Physician Assistants

Variable	Nurse Practitioners (n =227)	Physician Assistants (n =70)	χ^2	df	P
Provides Current PA Counseling ^{a, b, d}					
Yes	n =171 (75%)	n =45 (64%)			
No	n =56 (25%)	n =25 (36%)	3.29	1	0.07
PA Counseling Knowledge ^{a, c, d}	Nurse Practitioners (n =233)	Physician Assistants (n =73)			
	3.6 ± 1.0	3.8 ± 0.9			
1	n =6 (3%)	n =3 (4%)			
2	n =21 (9%)	n =1 (1%)			
3	n =80 (34%)	n =20 (27%)			
4	n =83 (36%)	n =35 (48%)			
5	n =43 (18%)	n =14 (19%)	7.98	4	0.92
PA Counseling Confidence ^{a, c, d}	Nurse Practitioners (n =231)	Physician Assistants (n =73)			
	3.7 ± 1.0	3.7 ± 0.9			
1	n =4 (2%)	n =1 (1%)			
2	n =24 (10%)	n =3 (4%)			
3	n =74 (32%)	n =25 (34%)			
4	n =74 (32%)	n =31 (42%)			
5	n =55 (24%)	n =13 (18%)	5.23	4	0.26

Note. PA = physical activity; χ^2 = chi-square; df = degrees of freedom

^aData are present as mean ± standard deviation, or n (percentage) when appropriate.

^bRefers to routinely counseling clients to accumulate 30 minutes of moderate intensity physical activity on most days of the week

^cWhere 1 is the least amount of knowledge or confidence and 5 is the most amount of knowledge or confidence

^dThere were some missing data

Table 6
Self-Reported Differences in Educational Training to Provide PA Counseling by Nurse Practitioners and Physician Assistants

Variable	Nurse Practitioners (n =233)	Physician Assistants (n =73)	χ^2	df	P
Physical activity training received during NP or physician assistant program ^a					
Yes	n =113 (48%)	n =42 (58%)			
No	n =120 (52%)	n =31 (42%)	1.82	1	0.18
If yes, which of the following topics did you receive preparation about:					
Health benefits of physical activity ^b	n =113 (100%)	n =42 (100%)	0.99	1	0.61
Physiology of physical activity ^b	n =75 (66%)	n =27 (64%)	0.33	1	0.57
Type or mode to advise ^b	n =66 (58%)	n =21 (50%)	0.01	1	0.94
Intensity of physical activity to advise ^b	n =51 (45%)	n =22 (52%)	1.70	1	0.19
Use of Rating of Perceived Exertion to gauge intensity ^b	n =10 (9%)	n =4 (9%)	0.14	1	0.71
Use of maximum heart rate to gauge intensity ^b	n =53 (47%)	n =21 (50%)	0.84	1	0.36
Duration to advise ^b	n =89 (79%)	n =34 (81%)	1.12	1	0.28
Frequency to advise ^b	n =94 (83%)	n =38 (90%)	1.80	1	0.18
Other education preparation for physical activity counseling					
Yes	n =111 (47%)	n =42 (57%)			
No	n =123 (53%)	n =32 (43%)	0.35	1	0.56
If yes, which of the following topics did you receive preparation about:					
Baccalaureate nursing program ^b	n =33 (30%)	--			
Baccalaureate physician assistant program ^b	--	n =1 (2%)			
Master's program ^b	n =25 (23%)	n =4 (10%)	1.94	1	0.16
Additional coursework ^b	n =22 (20%)	n =6 (14%)	0.15	1	0.70
Conference(s), workshops(s), seminar(s) ^b	n =65 (59%)	n =9 (21%)	7.79	1	0.005**
Self-study ^b	n =72 (65%)	n =22 (52%)	0.07	1	0.79
Other ^b	n =27 (24%)	n =16 (38%)	5.83	1	0.05*

Note. PA = physical activity; χ^2 = chi-square; df = degrees of freedom

^a There were some missing data

^b Percentage here represents the total of those responding yes to receiving additional PA counseling preparation

*Significant at the 0.05 level

** Significant at the 0.01 level

Table 7
Physical Activity Counseling Practices by Nurse Practitioners and Physician Assistants

	Number of individuals indicating use in practice, and percentage of total sample ^b ^c (N=318)	Percentage of participants ranking method as their #1 practice ^b
Assessment		
Question client about physical activity	n =283 (89%)	45%
Measure client's height and weight	n =257 (81%)	27%
Calculate client's percent body fat	n =164 (52%)	4%
Ask clients to perform a test of physical performance	n =149 (47%)	>1%
Assess general appearance	n =280 (88%)	23%
Other	n =24 (8%)	13%
Counseling		
Discuss with patient	n =295 (89%)	91%
Provide written materials	n =196 (81%)	2%
Refer patient to exercise specialist/program	n =169 (52%)	7%
Nothing specific	n =64 (47%)	3%
Other	n =31 (10%)	16%
Frequency		
Once a day	n =187 (59%)	29%
Several times/day	n =140 (44%)	11%
Three times a week	n =223 (70%)	43%
Most days of the week	n =240 (75%)	28%
Other	n =39 (12%)	28%
Duration		
A total of 20 minutes a day	n =203 (64%)	37%
A total of 30 minutes a day	n =247 (78%)	63%
A total of 40 minutes a day	n =247 (78%)	13%
Other	n =83 (26%)	54%
Type		
Walking	n =290 (91%)	91%
Jogging	n =151 (47%)	1%
Biking/Cycling	n =208 (65%)	1%
Swimming	n =243 (76%)	3%

Aerobics	n =170 (53%)	>1%
Active Sports	n =171 (54%)	>1%
Household/Garden Activities	n =207 (65%)	3%
Work/Occupational Activities	n =158 (50%)	4%
Other	n =52 (16%)	29%
Intensity		
60-85% of Maximum Heart Rate	n =142 (45%)	30%
12-13 rating of perceived exertion	n =64 (20%)	6%
60-70% of maximum METs	n =56 (18%)	2%
Talk Test	n =196 (62%)	55%
Moderate intensity equivalent to a brisk 3-4 mph walk	n =203 (64%)	52%
Other	n =46 (14%)	70%

^a Participants were asked to rank their use of these methods in practice, where 1 indicates the most commonly used. If participants did not use a particular practice, they were asked to leave it blank.

^b Percentages will not add up to 100%

^c There were some missing data

Table 8

Chi-Square Analysis of Self-Reported Barriers to Physical Activity Counseling by Nurse Practitioners and Physician Assistants

Barrier ^a	Nurse Practitioners (n=240)	Physician Assistants (n=78)	χ^2	df	P
Lack of time	n =123 (51%)	n= 48 (62%)	3.54	1	0.06
Not a high priority	n =19 (8%)	n =6 (8%)	0.002	1	0.96
Other concerns are more important	n =117 (48%)	n =46 (59%)	2.67	1	0.10
Language barrier	n =38 (16%)	n =12 (15%)	0.005	1	0.95
Useless, client's won't follow through	n =15 (6%)	n =17 (22%)	15.94	1	0.001**
No reimbursement for physical activity counseling	n =24 (10%)	n =6 (8%)	0.34	1	0.56
Most clients are already physically active	n =11 (5%)	n =8 (10%)	3.45	1	0.63
Unsafe neighborhoods	n =31 (13%)	n =3 (4%)	4.99	1	0.03*
Other	n =48 (20%)	n =9 (12%)	2.77	1	0.10

Note. PA = physical activity; χ^2 = chi-square; df = degrees of freedom^a Participants could report more than one barrier

*Significant at the 0.05 level

** Significant at the 0.01 level

References

- American Academy of Nurse Practitioners. (n.d.). About Nurse Practitioners. Retrieved September 9, 2009, from <http://aanp.org/AANPCMS2/AboutAANP/About+NPs>
- American Academy of Physician Assistants. (n.d.). American Academy of Physician Assistants Data and Statistics. Retrieved November 19, 2009, from <http://www.aapa.org/about-pas/data-and-statistics>
- Arizona State Board of Nursing. (2011). Daily Arizona Nursing Statistics. Retrieved February 22, 2011, from <http://www.azbn.gov/Default>
- Buchholz, S. W., & Purath, J. (2007). Physical activity and physical fitness counseling patterns of adult nurse practitioners. *Journal of the American Academy of Nurse Practitioners*, 19, 86-92. doi:10.1111/j.1745-7599.2006.00197.x
- Bull, F. C. L., Schipper, E. C. C., Jamrozik, K., & Blanksby, B. A. (1995). Beliefs and behavior of general practitioners regarding promotion of physical activity. *Australian Journal of Public Health*, 19, 300-304. doi:10.1111/j.1753-6405.1995.tb00448.x
- Burns, K. J., Camaione, D. N., & Chatterton, C. T. (2000). Prescription of physical activity by adult nurse practitioners: A national survey. *Nursing Outlook*, 48, 28-33. doi:10.1067/mno.2000.99101
- Calfas, K. J., Long, B. J., Sallis, J. F., Wooten, W. J., Pratt, M., & Patrick, K. (1996). A controlled trial of physician counseling to promote the adoption of physical activity. *Preventive Medicine*, 25, 225-233. doi:10.1006/pmed.1996.0050
- Centers for Disease Control and Prevention [CDC]. (2007, November 23). Prevalence of regular physical activity among adults -- United States, 2001 and 2005. *Morbidity and Mortality Weekly Report*, 56, 1209-1212. Retrieved November 23, 2008, from <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5646a1.htm>
- Douglas, F., Torrance, N., van Teijlingen, E., Meloni, S., & Kerr, A. (2006). Primary care staff's views and experiences related to routinely advising patients about physical activity. A questionnaire survey. *BMC Public Health*, 6, 138-148. doi:10.1186/1471-2458-6-138
- Eden, K. B., Orleans, T., Mulrow, C. D., Pender, N. J., & Teutsch, S. M. (2002). Does counseling by clinicians improve physical activity? A summary of

the evidence for the U. S. Preventive Services Task Force. *Annals of Internal Medicine*, 137, 208-215. Retrieved from <http://www.acponline.org.ezproxy1.lib.asu.edu/journals/annals/annaltoc.htm>

- Elley, C., Kerse, N., Arroll, B., & Robinson, E. (2003). Effectiveness of counseling patients on physical activity in general practice: cluster randomized controlled trial. *British Medical Journal*, 326, 793-799. doi:10.1136/bmj.326.7393.793
- Everett, C. M., Schumacher, J. R., Wright, A., & Smith, M. A. (2009). Physician assistants and nurse practitioners as a usual source of care. *Journal of Rural Health*, 25, 407-414. doi:10.1111/j.1748-0361.2009.00252.x
- Garry, J. P., Diamond, J. J., & Whitley, T. W. (2002). Physical activity curricula in medical schools. *Academic Medicine*, 77, 818-821. doi:10.1097/00001888-200208000-00011
- Goldstein, M. G., Pinto, B. M., Marcus, B. H., Lynn, H., Jette, A. M., Rakowski, W., ... Tennstedt, S. (1999). Physician-based physical activity counseling for middle-aged and older adults: A randomized trial. *Annals of Behavioral Medicine*, 21, 40-47. doi:10.1007/BF02895032
- Grandes, G., Sanchez, A., Sanchez-Pinilla, R. O., Ortega, R., Torcal, J., Montoya, I., ... Serra, J. (2009). Effectiveness of physical activity advice and prescription by physicians in routine primary care. A cluster randomized trial. *Archives of Internal Medicine*, 169(7), 694-701. doi:10.1001/archinternmed.2009.23
- Harland, J., White, M., Drinkwater, C., Chinn, D., Farr, L., & Howel, D. (1999). The Newcastle exercise project: A randomised controlled trial of methods to promote physical activity in primary care. *British Medical Journal*, 319, 828-832. Retrieved from <http://www.jstor.org/stable/i25185866>
- Hooker, R. S. (2006). Physician assistants and nurse practitioners: the United States experience. *Medical Journal of Australia*, 185, 4-7.
- Institute of Medicine of the National Academies [IOM]. (2008). The health care workforce for older Americans: Promoting team care. Washington, D. C.: National Academies Press. Retrieved February 26, 2011, from <http://www.iom.edu/Activities/Workforce/agingamerica/2008-OCT-07>
- Jacobson, D. M., Strohecker, L., Compton, M. T., & Katz, D. L. (2005). Physical activity counseling in the adult primary care setting. Position statement of the American College of Preventive Medicine. *American Journal of Preventive Medicine*, 29, 158-162. doi:10.1016/j.amepre.2005.04.009

- Kaiser Family StateHealthFacts.org. (2010). Arizona: Non-physician providers. Retrieved February 22, 2011, from <http://www.statehealthfacts.org/index>
- Kerse, N., Elley, C. R., Robinson, E., Arroll, B. (2005). Is physical activity counseling effective for older people? A cluster randomized, controlled trial in primary care. *Journal of the American Geriatric Society*, 53, 1951-1956.
- Lawlor, D. A., & Hanratty, B. (2001). The effect of physical activity advice given in routine primary care consultations: A systematic review. *Journal of Public Health Medicine*, 23, 219-226. doi:10.1093/pubmed/23.3.219
- Lawlor, D. A., Keen, S., & Neal, R. D. (1999). Increasing population levels of physical activity through primary care: GPs' knowledge, attitudes and self-reported practice. *Family Practice*, 16, 250-254. doi:10.1093/fampra/16.3.250
- Lewis, B. S., & Lynch, W. D. (1993). The effect of physician advice on exercise behavior. *Preventive Medicine*, 22, 110-121. doi:10.1006/pmed.1993.1008
- Norris, S. L., Grothaus, L. C., Bucner, D. M., & Pratt, M. (2000). Effectiveness of physician-based assessment and counseling for exercise in a staff model HMO. *Preventive Medicine*, 30, 513-523. doi:10.1006/pmed.2000.0673
- Pinto, B. M., Goldstein, M. G., & Marcus, B. H. (1998). Activity counseling by primary care physicians. *Preventive Medicine*, 27, 506-513. doi:10.1006/pmed.1998.0335
- Rogers, L. Q., Bailey, J. E., Gutin, B., Johnson, K. C., Levine, M. A., Milan, F., ... Sherman, S. E. (2002). Teaching resident physicians to provide exercise counseling: A needs assessment. *Academic Medicine*, 77, 841-844. doi:10.1097/00001888-200208000-00019
- Sallis, J. F. (2009). Exercise is medicine and physicians need to prescribe it! *British Journal of Sports Medicine*, 43, 3-4. doi:10.1136/bjism.2008.054825
- Sherman, S. E., & Hershman, W. Y. (1993). Exercise counseling: How do general internists do? *Journal of General Internal Medicine*, 8, 243-248. doi:10.1007/BF02600089
- Smith, B. J., Bauman, A. E., Bull, F. C., Booth, M. L., & Harris, M. F. (2000). Promoting physical activity in general practice: a controlled trial of written

advice and information materials. *British Journal of Sports Medicine*, 34, 262–267. doi:10.1136/bjism.34.4.262

Tulloch, H., Fortier, M., & Hogg, W. (2006). Physical activity counseling in primary care: Who has and who should be counseling? *Patient Education and Counseling*, 64, 6-20. doi:10.1016/j.pec.2005.10.010

U. S. Department of Health and Human Services [USDHHS]. (1996). Physical activity and health: A report of the Surgeon General. Atlanta, Georgia: U. S. Department of Health and Human Services, Centers for Disease Control and Prevention. Retrieved November 11, 2008, from <http://www.cdc.gov/nccdphp/sgr/contents.htm>

Chapter 5

NURSE PRACTITIONER AND PHYSICIAN ASSISTANT PHYSICAL ACTIVITY COUNSELING PRACTICES AND KNOWLEDGE: A QUALITATIVE STUDY

Abstract

Health care providers (HCPs) are an important source of physical activity (PA) information. This study qualitatively examined nurse practitioners' (NPs) and physician assistants' current PA counseling practices and potential influences on these practices including knowledge and confidence to provide PA counseling and barriers to counseling. Five focus groups (FGs), stratified by practice type, were conducted with physician assistants (n=10) and NPs (n=22). FG discussions were conducted by a trained moderator using a standardized moderators' guide. All groups were audio-recorded, transcribed verbatim and coded. NVivo software was used to manage codes. Both NPs and physician assistants reported discussing PA with their patients, particularly those with chronic illness. Lifestyle modification was the most commonly reported type of counseling provided. Confidence to counsel was associated with having PA knowledge and providing simple counseling. Barriers to counseling included having more important things to discuss, lack of time, the current healthcare system, lack of reimbursement, and perceived patient financial barriers. PA recommendation knowledge was highly variable, with few participants reporting specific guidelines. Participants, while not familiar with "Exercise is Medicine" indicated interest in its use and learning more. NPs and physician assistants are providing some level of PA counseling;

however, these findings suggest that additional training in PA counseling is warranted and desired.

Introduction

The benefits of leading a physically active lifestyle are well known and include decreased risk for cardiovascular disease, depression, diabetes, premature morbidity, and some types of cancer (USDHHS, 1996; USDHHS, 2009). Yet the majority of U. S. adults are not obtaining the recommended amounts of PA (USDHHS, 2009). One of the Healthy People 2020 objectives is to increase the proportion of adults engaged in moderate intensity PA for more than 300 minutes a week or more than 150 minutes per week of vigorous intensity PA (USDHHS, 2009). Additional objectives set forth by Healthy People 2020 include increasing the proportion of physician office visits for chronic health diseases or conditions that include counseling or education related to exercise and to increase the proportion of physician visits made by all child and adult patients that include counseling about exercise (USDHHS, 2009).

The importance of including PA counseling during HCP encounters is clearly articulated in the “Exercise is Medicine” initiative of the American College of Sports Medicine (ACSM). This initiative calls for making PA assessment and prescription a standard part of disease prevention and treatment (Sallis, 2009). Key components of this initiative include generating awareness that “Exercise is Medicine,” assisting HCPs to become more effective in counseling and referring patients for increased PA, generating policy changes to support PA counseling and referrals, creating an expectation among patients and their HCPs to have a dialogue regarding PA, and encouraging physicians and HCPs to be more physically active (Jonas & Phillips, 2009).

Evidence suggests that HCPs are considered a credible and preferred source of PA information and advice (Petrella & Lattanzio, 20002; Tulloch, Fortier, & Hogg, 2006). Non-physician clinicians, such as NPs and physician assistants, are increasingly being utilized as primary HCPs for numerous reasons. The IOM (2010) has emphasized an interdisciplinary approach to medical care that uses NPs and physician assistants as primary care providers. Fewer medical school graduates are choosing primary care practice as their specialty leaving a gap that needs to be filled. NPs and physician assistants are also being used more frequently as PCPs in an effort to improve access and reduce health care costs (Buchholz & Purath, 2007; Everett et al., 2009; Hooker, 2006). As NPs and physician assistants are increasingly being relied upon as primary HCPs, it is important to understand their current PA counseling practices and the potential influences on such practices. Qualitative research is an appropriate method of inquiry to use when there is limited information about an area. It is not restricted in terms of questions, nor limited by statistical interpretation (Strauss & Corbin, 1990). Rather, this type of data can lead to insight that may not be found through quantitative methods.

While some previous qualitative research regarding PA counseling has been performed with NPs specific to PA promotion in the geriatric population (Melillo et al., 2000), this type of information from the physician assistant population is noticeably absent. The information obtained as a result of this study will fill gaps in the literature including identifying NPs and physician assistants (1) current counseling practices, (2) perceived confidence to provide PA

counseling, (3) perceived knowledge of PA and sources of this knowledge, (4) familiarity with and perceived usefulness of the “Exercise is Medicine” initiative (Sallis, 2009), (5) the types of information that would aid in PA counseling and the best delivery mechanisms for this information and (6) a qualitative comparison of the similarities and differences between these providers regarding these objectives.

Methods

Setting and Design

This study qualitatively examined current PA counseling practices of both NPs and physician assistants as well as the potential influences on PA counseling practices including knowledge of PA, confidence to counsel PA, and barriers to PA counseling. Five FGs stratified by participant profession (three NP FGs and two physician assistant FGs) were conducted. A modified grounded theory approach was used to reveal themes that emerged from FG discussions.

Sample

FG participants (n=5-12 per group) were NPs and physician assistants currently practicing in Arizona (Figure 1). Inclusion criteria included being a licensed NP or physician assistant currently practicing in a facility where PA counseling would be appropriate and applicable with the ability to read and write in English. FG participants were recruited in person and through email from local Arizona hospitals and clinics, the Arizona Nurses Association, the Arizona State Association of Physician Assistants, and other nursing and physician assistants organizations (e.g. Arizona Nurse Practitioner Council) located in Arizona.

Participants interested in participating were screened via email or telephone to ensure inclusion criteria were met. The Arizona State University Institutional Review Board approved this study.

Instrumentation

FG participants completed a modified version of the PPAHQ for the purpose of obtaining general demographics (Buchholz & Purath, 2007; Burns et al., 2000). The questionnaire version used in this study, the Promotion of Physical Activity and Health Practitioners Questionnaire (PPAHQ) was modified to include physician assistants. Collected demographics include participant age, sex, years of practice, practice locale (urban, suburban, rural), type of practice facility, average age of patients, percentage of patients practitioners perceive as sedentary, and self-reported physical activity level.

Following a literature review of the background, need for, and effectiveness of HCP interventions as well as previous cross-sectional studies assessing PA counseling by HCPs, a moderator's guide was created. The moderator's guide was pilot tested with NPs (n=5) resulting in subtle changes in question wording and the addition of one question. Because only minimal changes were made to the moderator's guide, the data from the pilot FG were included in analyses.

Procedures

FGs were moderated by one individual with previous experience conducting FGs. Each group discussion was audio-recorded and transcribed verbatim. Two investigators trained in qualitative research independently read all

transcripts and generated an initial code book. Both individuals then used the codebook to independently code each FG transcript before consensus coding. Throughout the consensus coding process, new codes and their definitions were discussed as needed, added to the codebook, and previously coded transcripts were re-coded as necessary. Consensus codes for all transcripts were entered into NVivo (QSR International, Cambridge, Massachusetts, USA).

Trustworthiness is an important factor in determining reliability and validity of qualitative studies. Guba describes four factors for trustworthiness including credibility, transferability, dependability, and confirmability (Shenton, 2004). Credibility in qualitative research refers to internal validity and approaches that can be taken to ensure this include the utilization of well-established qualitative research methods and the appropriate examination of current research findings as they relate to previous study findings. Transferability, referring to external validity or generalizability, is difficult to establish in qualitative research. However, one step toward transferability is the clear provision of the context in which the data was obtained including number of participants involved, data methods employed, and the number and length of data collection sessions. According to Shenton (2004) dependability here refers to reliability. Similar to transferability, one approach toward ensuring dependability is to provide an “in-depth methodological description to allow study to be repeated.” Confirmability refers to objectivity, and one method to approach this is through data triangulation. Each of these factors was taken into consideration for the present study.

Analyses

Descriptive statistics were calculated to describe the characteristics of FG participants (mean and standard deviation; median and interquartile range). The Kolmogorov-Smirnov statistic and histograms were used to test normality of variables. One-Way analysis of variance (ANOVAs), Mann-Whitney U Tests and Chi-Square tests for independence were used to assess differences between NP and physician assistant groups on these variables. Equality of variance was checked using Levene's test. Analyses were performed using SPSS (PASW Statistics, Version 18.0.0, SPSS Institute Inc., 2010, Chicago, IL) and results were considered significant if P-value was ≤ 0.05 .

A modified grounded theory approach using the constant comparison method was used for the qualitative analysis (Lincoln & Guba, 1985; Strauss & Corbin, 1990). Each FG transcript was analyzed using a line-by-line microanalysis to create units of information. As each unit was discerned, it was compared to previously identified units. This selection and comparison of units allows for the theoretical properties of the category begin to emerge. NVIVO software was used to organize and manage the data (QSR International, n.d.). Resulting categories were examined and compared to determine possible relationships among them. This constant comparison method allows for thematic analysis of data that was utilized to make comparisons between themes among NPs and physician assistants.

Results

The participant recruitment process is shown in Figure 1. Characteristics of participants (n=32) are reported in Tables 9 and 10. The majority (91%) of all FG participants were female. Practice sites for NP participants included: family practice, women's health, primary care, psychiatric, cardio-thoracic vascular, women's health, family practice, pediatric, nephrology, oncology, and neurology. Practice sites for physician assistant participants included: family practice, gastroenterology, transplant medicine, pediatrics, and cardiology.

Current Counseling Practices

Both NPs and physician assistants indicated that they regularly counsel their patients about PA. Participants in all five FGs indicated that PA counseling is part of their routine practice. NPs and physician assistants were most likely to counsel patients about PA during routine physicals including yearly well exams and/or during a new patient's first visit. Participants in two FGs (n=1 NP; 1 physician assistant) said they counsel every patient about PA.

Both NPs and physician assistants indicated that certain patient characteristics or conditions prompt them to discuss PA with their patients. Practitioners in all five groups indicated that they provided PA counseling to people who presented with chronic illnesses such as diabetes, heart disease, stroke, cancer, or depression that could be improved or controlled through exercise. Participants in four FGs indicated that they routinely counsel patients who are overweight or obese about the importance of PA for weight loss especially among overweight or obese individuals who have diabetes. Participants in three FGs indicated that they also counseled patients who were inactive to

become more active but typically only when other factors are also present, such as a chronic disease. Providers indicated that they typically initiate discussions about PA with their patients. When patients did bring up physical activity to their providers, it was usually in the context of chronic illness and/or weight loss (n=3 FGs). Themes and illustrative quotations for counseling practices are listed in Table 11. Barriers to providing PA counseling are listed in Table 12.

The counseling topics addressed by the HCPs were similar. Participants in each of the five FGs indicated that lifestyle modifications are the principle topic when providing PA counseling. Advice given by providers about lifestyle modifications included advising patients to incorporate small amounts of PA into their day (n=3 FGs) and get the family involved in the activity (n=2 FGs). Walking (n=5 FGs) followed by water aerobics (n=3 FGs) were the most commonly recommended types of physical activity by providers. Duration of PA was another commonly addressed topic according to our providers (n=4 FGs) with the most prescribed duration being 30 minutes of PA (n=3 FGs). Other less commonly topics were exercises to avoid (n=2 FGs) and were principally addressed to prevent injury on the part of the patient.

Beyond verbal advice, the FG participants took several different PA counseling actions. The most common action taken was an assessment of the patient's current PA level. The primary method of assessing patient's current PA included asking patients about what they currently do for PA. Two NP FGs also described calculating patient body mass index and discussing goals for body weight. Referrals to exercise specialists, physical therapists in particular, was a

commonly reported counseling action by participants (n=3 FGs). Physician assistant participants also reported referring patients to cardiologists for advice about what activities are appropriate for them (n=2 FGs). NP participants (n=3 FGs), in particular, reported providing written information for patients, specifically in the form of handouts as a common counseling action. Physician assistants did not describe providing PA-related written information to patients.

Several barriers to PA counseling were identified. Similar to what participants indicated on the survey, having more important things to discuss was the most commonly reported barrier (n=5 FGs; 70% of all FG participants; 90% of physician assistant participants), particularly when patients are experiencing complications from chronic health problems and/or have concerns about medication. Similarly, lack of time was commonly perceived as a barrier. Participants in four FGs articulated a need to prioritize how they spent their time with patients due to time restrictions on patient encounters. Approximately 56% of FG participants reported time as a barrier to PA counseling (n=11 NPs; n=7 physician assistants). Related, the current healthcare system was also reported as a barrier to PA counseling (n= 4 FGs). Specifically participants perceived that the system is not set up for health promotion, but rather is set up to provide patients with medication. Time was mentioned again as a factor here, particularly regarding the length of time practitioners have with patients per appointment.

Another barrier described by participants (n=4 FGs) is lack of reimbursement for providing PA counseling. More specifically, in one of the NP FGs, it was described that the requirement to code each patient visit as a particular

type of visit for reimbursement purposes can be complicated by providing counseling during the visit. Similarly, perceived patient financial barriers were also described as a barrier to PA counseling (n=4 FGs). It was perceived that if insurance does not cover personal training or exercise professional expenses for patients, then patients are simply not going to participate in it. Further, it was stated that the co-pay for a physical therapist visit or the cost of a follow-up medical visit specifically for PA counseling can be limiting. Lack of PA supervision for patients was also reported as a barrier (n=3 FGs).

Other barriers described by FG participants but were not mentioned enough to be considered themes included lack of patient interest (n=2 FGs), specifically, the perception that patients need to have the appropriate motivation or buy-in to translate PA counseling into action. It was also stated that patients want a quick fix for health and don't want to change their lifestyles. Loss of follow-up was also reported a barrier (n=2 FGs), specifically, patients who don't show up for appointments or those who don't come back after an initial appointment. Another barrier reported by participants (n=2 FGs) is their own personal health and lack of PA as a provider. In particular, it was expressed, that as a provider, being physically active is important in terms of having patients listen and follow your PA advice.

Confidence to Provide PA Counseling

While the majority of FG participants stated that they routinely counsel their patients about PA, their confidence to provide counseling was influenced by a wide variety of factors. Participants in four FGs suggested that being

knowledgeable about PA either through personal experience, training or reading information about PA enhances their confidence to talk with their patients about PA. Likewise, participants in three of the FGs stated that they are more confident about counseling patients when they can provide “simple” PA advice. For example, providers felt confident when they could tell their patients to start walking or to make simple lifestyle modifications to increase their activity levels.

FG participants described several factors that decrease confidence to provide PA counseling. However, only a few were mentioned often enough to be considered themes, including patients with chronic diseases (n=4 FGs), fear of potential injury to patient (n=4 FGs), and provision of expert advice (n=2 FGs). Specific conditions mentioned as decreasing confidence included obesity or morbid obesity (n=2 FGs), heart disease (n=2 FGs), depression (n=1 FG), and those with a long history of illness or with co-morbid conditions, particularly when a patient has impaired strength or is compromised as a result. In general, it was perceived that physical therapists or other HCPs should address PA in these individuals. Another factor associated with decreased counseling confidence was a fear of causing injury or harm to the patient. There was a general concern that the PA prescribed to patients might cause more harm than good. Implicit in this was a concern about the liability of the practitioner. Related to this, practitioners expressed concern about their patients becoming injured, experiencing pain, or having a fall as a result of being physically active. Participants (n=3 FGs) also described decreased confidence in their ability to provide “expert” PA advice. For example, they were not comfortable with giving advice on how to train for a

particular sporting event such as a marathon or writing a specific exercise plan for obese individuals.

PA Counseling Knowledge and Sources of Knowledge

A few participants in all five FGs indicated that they had heard of the current PA guidelines but few could articulate specific components. Duration was the principle component of PA recommendations providers described. Providers in all five FGs stated that their understanding is that 30 minutes of PA is the recommended duration. Other recommended durations described included 20 minutes (n=2 FGs), 45 minutes (n=2 FGs), and 60 minutes (n=2 FGs).

Recommendation knowledge was highly variable among physician assistant participants. Physician assistant respondents appeared to express additional PA recommendation knowledge beyond just duration including “moderate intensity,” “getting your heart rate to 80% of max,” and that “PA can be divided into blocks and you don’t have to do it all at one time.” Both NP and physician assistant participants perceived that PA recommendations are always changing (n=3 FGs). Themes and illustrative quotations for PA counseling knowledge, interest in Exercise is Medicine, and desired delivery methods of additional training are listed in Table 12.

Both NP and physician assistant FG participants described several sources of PA knowledge. Previous training as a source of PA counseling knowledge was mentioned in all five FGs. Specifically, NPs described learning about preventive care and the benefits of PA for chronic disease, while physician assistants

described learning about specific PA guidelines for diabetes, hypertension and other types of chronic disease that are affected by sedentary lifestyle. However, a lack of training related to HCP training programs was also described by FG participants (n=4 FGs). Some NP participants described the training they received in their HCP program as what an average person might have learned from reading about exercise. Similarly, several physician assistant participants reported that PA specific training was limited to just a sentence or two regarding general PA guidelines. Other commonly reported types of training (not specifically related to HCP program) included undergraduate exercise physiology and college physical education classes (n=3 FGs).

Many of the practitioners reported seeking information about physical activity through outside courses. Reading journal/magazine articles and online sources (n=4 FGs) were also reported by several FG participants and NP participants in particular. Such sources include the American Heart Association website, Healthy People 2010, and general PA-related internet searches. Fitness professionals (n=4 FGs) were another commonly reported sources of PA knowledge and included personal trainers, group fitness instructors, and physical therapists.

Familiarity and Interest in “Exercise is Medicine” Initiative

During each FG, participants were asked if they were familiar with the ACSM Exercise is Medicine initiative. Only two participants in one FG had heard of the initiative through a continuing education talk at their place of employment. All FG participants were then provided a copy of the ACSM Exercise is Medicine

Health Care Providers Action Guide which outlines how to implement Exercise is Medicine with patients (ExerciseIsMedicine.org, n.d.).

The guides were briefly explained and participants were given several minutes to look over the guide, before being asked whether they believed such tools would be useful for them in their own practice. The majority of all FG participants (n=4 FG) agreed that this information would be useful. However, there was one FG of hospital-based NPs who did not think the information would be appropriate for the population they served. Most of their patients were older and in poor health. Their efforts focused on preventing their patients from entering a nursing home and these NPs suggested that the guide would be most useful in an outpatient setting.

The main concerns expressed regarding the implementation of the Exercise is Medicine program included the availability of handouts in additional languages and the apparent lack of handouts tailored to children or adolescents. Insurance coverage was another concern mentioned by participants (n=2 FGs), specifically, the prescription format and the perceived association between writing a prescription and having some type of insurance coverage. Similarly, a few practitioners (n=2 FGs) indicated that their lack of knowledge regarding PA recommendations and exercise prescription would limit the usefulness of Exercise is Medicine in practice.

Additionally, participants were asked to describe whether they believed this Exercise is Medicine approach could be implemented using the provided guide alone, if additional information would be necessary and, if so, how they

would like this information delivered. Both NP and physician assistant participants (n=3 FGs) indicated that while the handouts were something that could be used in practice immediately, overall, more information regarding Exercise is Medicine and how it can be used would be preferred. In terms of delivery, the majority of NPs expressed greater interest in participating in an in-service on Exercise is Medicine particularly if continuing education credits were available, with online learning as a secondary method. In contrast, physician assistants reported greater interest in learning online, with in-service education reported as a secondary interest.

PA Counseling Information of Interest and Delivery of Such information

FG discussion also provided insight into other types of information about PA counseling that would be beneficial for HCPs. NP participants reported a greater breadth of topics they are interested in learning about including affordable and creative exercise options, fitness and PA assessment, and community resources available for their patients. Physician assistants reported fewer PA counseling topics of interest including community resources available and/or specific, simple information that can be provided for patients. Desired delivery methods for such information, included trainings at conferences (n=3 FGs), online (n=2 FGs), or during in-service (n=2 FGs) events.

Discussion

This qualitative study examined the knowledge of, confidence to, and current counseling practices of NPs and physician assistants. Our findings indicate that NPs and physician assistants are providing some level of PA counseling, particularly during yearly well exams and during a patient's first visit or when the patient presents with a chronic illness that can be helped by physical activity. Confidence to provide counseling was identified as an important factor in providing counseling and PA knowledge increased one's confidence to counsel. Further, knowledge of current PA recommendations (Haskell et al., 2007; USDHHS, 2008) was highly variable and FG discussion suggested a need for additional training. FG participants also reported little to no familiarity with the ACSM Exercise is Medicine initiative but after a brief introduction reported an interest in learning more about it and using such an approach in their practice. Finally, participants also described several PA-related topics of interest that they would be interested in learning more about and potential delivery methods for such information.

FG participants described the provision of lifestyle modifications as a principle type of PA counseling provided. Lambe and Collins (2010) also identified the provision of simple lifestyle information to patients as reported by their general practice and NP FG participants. Similarly, in two FGs with NPs, Mellilo et al. (2006) identified that the most commonly reported method of integrating PA into conversation with patients including asking them what they like to do for fun. It was also reported by these participants that the responsibility to address PA rested with the NP rather than the patient. Likewise, in the present

study, the majority of FG providers indicated that they typically have to initiate PA related discussion. Further, FG participants identified various factors that lead them to provide PA counseling including particular patient characteristics or conditions (e.g. chronic disease, overweight/obesity). Similarly, in FGs with NPs working with older adults, Melillo and colleagues (2000) noted that PA was often discussed with patients in relation to weight management. Common PA counseling topics described by FG participants in the present study include the recommendation that patients walk, participate in water aerobics, and be physically active for thirty-minutes at a time. Again, these findings are similar to what previous studies have reported (Buchholz & Purath, 2007; Burns et al., 2000).

Participants in the present study reported discussing PA with patients as the most common counseling action taken. Secondly, providing written material and/or providing a referral to an exercise specialist (e.g. physical therapist) were also reported counseling actions. A survey study by Tompkins, Belza, & Brown (2009) reported discussing PA with patients (56%) as a common counseling approach, followed by referral to a physical therapist (27%). Other cross-sectional data reported similar findings. Less than half of NPs (n=606; 43%) surveyed by Burns et al. (2000) reported referring patients to see an exercise specialist. NP FG participants in the present study reported providing PA-related written materials for patients. Buchholz and Purath (2007) reported provision of written PA material to patients as the second most common method (54%) of counseling among their NP survey respondents following general discussion of

PA (95%). Additionally, in the present study, a reported barrier by both NPs and physician assistants is a lack of an exercise specialist to whom a patient may be referred.

Other barriers reported by participants in the present study echo previously reported barriers to PA counseling and include having more important things to discuss, lack of time, the healthcare system, lack of reimbursement, and perceived patient financial barriers. Previous cross-sectional surveys with HCPs identified several of these same barriers (McDowell, McKenna, and Naylor, 1997; Tompkins, Belza, & Brown, 2009; Walsh et al., 1999; Sherman & Hershman, 1993). McDowell, McKenna, and Naylor (1997) identified the top two barriers to PA promotion by practice nurses (n=196) were lack of time and lack of appropriate protocol. Similarly, Tompkins, Belza, & Brown (2009) also identified lack of time (87%) and a perceived lack of patient interest (87%) in a survey of NPs (n=398). Melillo and colleagues (2000) qualitative NP study also found more important things to discuss as a barrier for NPs to provide PA counseling and report the current healthcare delivery system as an obstacle.

FG discussion in the present study also provided insight into facilitators or factors that increase confidence to provide PA counseling. Walsh and colleagues (1999) reported that physicians that were more confident or felt successful providing PA counseling were more likely to counsel patient about PA. Similarly, Sherman & Hershman (1993) found that physicians who felt moderately successful at getting patients to be active were also much more likely to provide PA counseling. Studies such as these suggest that confidence to

counsel is an important facilitator in providing PA counseling. In the present study, being knowledgeable of PA was a primary factor associated with increased confidence to provide such counseling. Several other studies of HCPs have come to similar conclusions (Dympna, 2007; Lambe & Collins, 2010). A qualitative study examining the health promotion practices of nurses identified training and skills related to health promotion as an extremely important self-identified factor to aid HCPs in providing health promotion counseling (Dympna, 2007). A cross-sectional survey of internist physicians (n=422), found that one-third of respondents identified a need for more practice with exercise counseling skills (Sherman & Hershman, 1993). It appears clear that confidence to provide such PA counseling is a factor in the provision of counseling and that knowledge of PA is an important factor in increasing confidence to provide counseling.

In the present study, knowledge of current PA recommendations was highly variable between FG participants. Duration of PA, specifically 30 minutes, was the most commonly reported part of the PA recommendations. Few could report the current American College of Sports Medicine and American Heart Association or the Surgeon General's Report. In the present study, several participants reported acquiring PA knowledge from their HCP program. However, just as many participants reported a lack of training for PA counseling through their HCP program. Previous survey studies report similar findings. Douglas and colleagues (2006) found that 40-60% of primary care staff (e.g. family physicians, practice nurses; n=757), reported that insufficient educational materials their PA counseling needs and approximately half thought there was a lack of PA training

(Douglas et al., 2006). McDowell, McKenna, and Naylor (1997) found that 37% (n=196 NPs) had not received any formal PA counseling training. Further, there was a significant difference in the amount of PA promotion training respondents had received over the past five-years, with the NPs that were promoting PA receiving more training (mean=6.18 hours) compared to the NPs that were not promoting PA (mean=1.51 hours). Similarly, Buchholz et al. (2007) found that more than half of their NP sample (n=96) reported lacking formal training to provide PA counseling and that additional training (e.g. conferences, self-study) was associated with increased confidence to provide PA counseling.

In the present study, participants in each of the five FGs reported some amount of training related to PA through one's HCP program. However, there were also participants in all five FGs that reported a lack of PA training from their HCP program. The amount of training reported was minimal. Little is known about other sources of PA knowledge by HCPs. In the present study, outside sources of PA knowledge include reading about PA from online sources and learning from fitness professionals including personal trainers, fitness instructors and physical therapists. With such an emphasis on the importance of PA knowledge to the provision of counseling, this lack of training is notable. Further research is needed to identify the effects of the provision of PA counseling training for HCPs.

The recent Exercise is Medicine initiative by the ACSM is a valuable approach for HCPs to provide PA counseling to the general public. Due to the recent launch of this initiative, little is known about its current use by HCPs. The

current findings suggest interest in and perceived usefulness of such an approach, particularly in an outpatient setting. We know of no previously published research regarding the use of Exercise Is Medicine by HCPs. The present study findings suggest a positive response to the use of Exercise is Medicine in this particular sample of HCPs. Further, physician assistant participants in the present study expressed interest in being able to provide patients with readily available PA information, and Exercise is Medicine handouts are one such easily executed method. Further studies should examine the effects of Exercise is Medicine training for and use by HCPs through in-service types of training and/or using an online format.

In the present study, FG participants were also asked to describe other types of information that would aid them in providing PA counseling and again, a need for additional training was identified. Similar to Melillo and colleagues (2000) conclusions, additional research is needed to examine the current PA-related curriculum for both NPs and physician assistants. Additionally, provision of training (e.g. in-service, online, etc), particularly for continuing education credit, for both NPs and physician assistants appear to be desired and warranted.

This study is not without limitations. The sample for this study was predominately Caucasian and highly educated. Selection bias is possible as providers who already have an interest in physical activity may have been more likely to volunteer their participation; further, the use of qualitative methods such as FGs limits generalizability of these findings. Despite these potential limitations, these findings provide important information regarding the use of PA

counseling by HCPs beyond what can be provided by quantitative measures alone.

In conclusion, these findings suggest that while there is some amount of PA counseling occurring by NPs and physician assistants, there is also a desire on the part of these providers for additional training specifically for PA counseling. Similarly, FG participants found the ACSM Exercise is Medicine initiative to be an acceptable approach to PA counseling by NPs and physician assistants, particularly with training to aid in its implementation. Based on these findings, there is a need and desire for additional training related for PA counseling among NPs and physician assistants. Future studies should further examine the effects of PA counseling training interventions, through HCP program curriculum or continuing education credit with NPs and/or physician assistants.

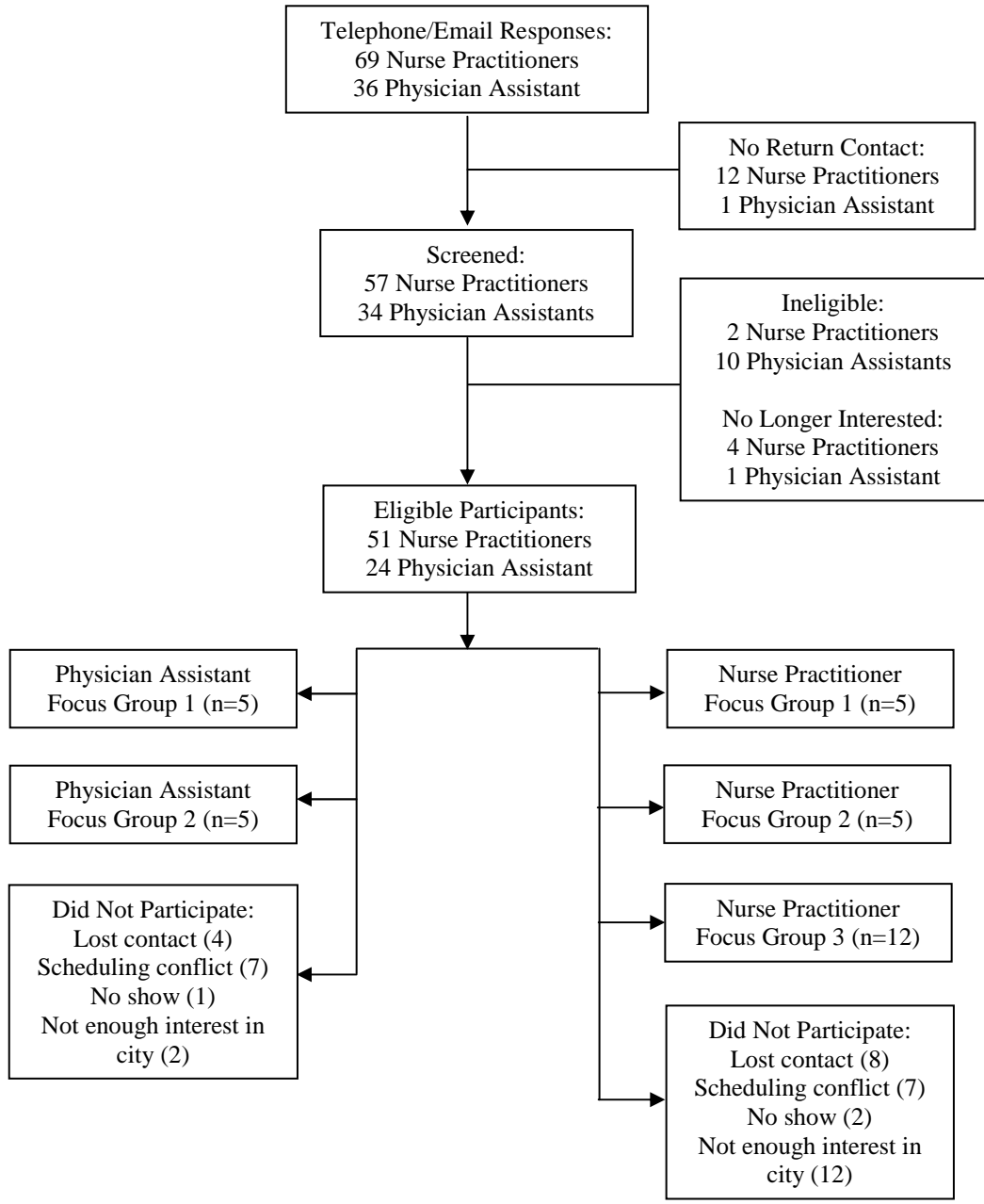


Figure 1. Participant recruitment and participation flow chart.

Table 9
Nurse Practitioner Focus Group Participant Characteristics Stratified by Individual Focus Group (N =22)

Variable	Focus Group 1 (n =5)	Focus Group 2 (n =5)	Focus Group 3 (n=12)	P
	Mean \pm SD, Median (IQR), or n (%)	Mean \pm SD, Median (IQR), or n (%)	Mean \pm SD, Median (IQR), or n (%)	
Age, y ^a	53 \pm 5	52 \pm 6	50 \pm 9	0.44
Sex				
Female	n =5 (100%)	n =4 (80%)	n =12 (100%)	
Male	n =0 (0%)	n =1 (20%)	n =0 (0%)	
Years of Practice ^a	17 \pm 3	11 \pm 5	11 \pm 5	0.08
Practice Locale				
Urban	n =1 (20%)	n =1 (20%)	n =3 (27%)	
Suburban	n =3 (60%)	n =1 (20%)	n =2 (18%)	
Rural	n =0 (0%)	n =0 (0%)	n =6 (55%)	
Type of Practice Facility				
Private Practice	n =2 (50%)	n =0 (0%)	n =5 (46%)	
Community Clinic	n =1 (25%)	n =0 (0%)	n =4 (36%)	
Hospital	n =0 (0%)	n =5 (100%)	n =0 (0%)	
Other	n =1 (25%)	n =0 (0%)	n =2 (18%)	
Age of Patients ^b	38 (32, 40)	80 (-,-)	35 (24, 44)	0.25
Percentage of Perceived Sedentary Patients ^b	48 (20, 75)	88 (80, 95)	65 (31, 75)	0.11
Self-Reported Physical Activity Level ^{c, d}	2.5 \pm 1.3	3.6 \pm 1.2	3.8 \pm 1.2	0.79

Note. SD = standard deviation; IQR = interquartile range

^a Determined using One-Way ANOVA

^b Determined using Mann-Whitney U-test

^c Determined using Chi-Sq test for independence

^d Self-reported using a 1-5 Likert scale, where 1=inactive and 5=vigorously active for 30-60 minutes on most days of the week.

Table 10
Physician Assistant Focus Group Participant Characteristics Stratified by Individual Focus Group (N =10)

Variable	Focus Group 1 (n =5)	Focus Group 2 (n =5)	<i>P</i>
	Mean \pm SD, Median (IQR), or n (%)	Mean \pm SD, Median (IQR), or n (%)	
Age, y ^a	32 \pm 4	46 \pm 13	0.06
Sex			
Female	n =4 (80%)	n =4 (80%)	
Male	n =1 (20%)	n =1 (20%)	
Years of Practice ^b	3 (1.5, 4)	4 (3, 32)	0.20
Practice Locale			
Urban	n =0 (0%)	n =3 (60%)	
Suburban	n =0 (0%)	n =1 (20%)	
Rural	n =5 (100%)	n =0 (0%)	
Type of Practice Facility			
Community Clinic	n =5 (100%)	n =0 (0%)	
Hospital	n =0 (0%)	n =3 (60%)	
Other	n =0 (0%)	n =2 (40%)	
Age of Patients ^a	36 \pm 5	46 \pm 26	0.46
Percentage of Perceived Sedentary Patients ^a	60 \pm 38	43 \pm 22	0.45
Self-Reported Physical Activity Level ^{c, d}	3.6 \pm 0.5	4 \pm 3.2	0.51

Note. SD = standard deviation; IQR = interquartile range

^a Determined using Independent T-Test

^b Determined using Mann-Whitney U-test

^c Determined using Chi-Sq test for independence

^d Self-reported using a 1-5 Likert scale, where 1=inactive and 5=vigorously active for 30-60 minutes on most days of the week.

Table 11

Summary of Current Counseling Practices and Factors Influencing Confidence to Counsel to Physical Activity Counseling

Key Themes	Nurse Practitioners (n=3)		Physician Assistants (n=2)	
	n	Illustrative quotations	n	Illustrative quotations
How PA Comes up During Appointments with Patients	3	“We also ask about physical activity. On our intake, for the first appointment, we always ask them about what kinds of activities they do.”	2	“Most of the time it would come up would be with new patients when we're reviewing social history, because you're getting into kind of their lifestyle habits at that point. That would be an area where I would see it.”
Characteristics That Influence Counseling				
Chronic illness	3	“I ask, I ask most of them, I think particularly anybody has diabetes or uh, high cholesterol, or obesity.”	2	“If they have chronic medical problems, or you can tell they've had a family history of it or you see symptoms either in their blood pressure, or their complaints or their labs that they are headed to something absolutely you bring that up.”
Overweight/Obesity	2	“When you do an interview, you are looking at their family health histories and personal medical history and when you see that you've got a patient there in front of you with an elevated BMI just from appearance, you know and you two really have to talk. There is really a need to discuss that. You'd be surprised at how many patients really don't know the risk.”	2	“I have to say that I have had struggles with EHR, which is Electronic Health Records. But the one thing that I do like is it calculates the BMI. So every patient that I see, and I see so many patients over 30, and you're like, “Oh, my gosh! They don't look that way.” You're thinking, “Oh, my gosh! It's supposed to be within this range to be healthy.” I would say over 85 percent of my patients are in the obese or morbidly obese, and you're like, “Hmm! Ok.” It kind of wakes you up. So that's the nice thing about Electronic Health Records, that it just sits there and you look at it because you wouldn't take the time or you don't have the time to go ahead and calculate the BMI. But it's right there for you.”
Counseling Topics				
Lifestyle	3	“I'll ask them, well what's kept you from	2	“I will ask them to get a pedometer and see if they get

modifications		exercising, and we'll kind of talk about lack of time, having kids, and I'll ask them why don't you take the kids to the park? You kind of figure out how to fit it into their lives. You can't just say go exercise and then come back and tell me. We have to have a little discussion about what their life is like. People are so busy."	their 10,000 steps, cause who knows, I'm not there to see how many they're doing, but that at least it opens the conversation. And if they do, let's get some more steps. I'll talk about taking the stairs and parking far away from the store."
Types of PA advised	3	"We look at their appearance and to make suggestions based on what they like to do – walking, I just keep it simple, walk, run, swim, ride your bike."	2 "I do recommend for people that are a little heavy, water aerobics or any water activity. Generally start with that if they can..."
Duration of PA advised	3	"Tell them to get out there and do something for 30 minutes every day"	1 "If it means you walk 2-minutes one day and then the next week you are able to work up to 5 minutes great, then I have them work up to an hour where they can't talk like to the person next to them."
Counseling Actions			
Current PA assessment	3	"You ask the question, what kind of physical activity do you do now?"	2 "Finding out why they are doing what they are doing so they can make those changes."
Referrals to exercise specialist	2	"Mostly what I do is order physical therapy, and I assume... although I've never verified with physical therapy that they talk with them about the importance of exercise. Now when I had physical therapy, they never talked about the importance of physical activity... so it might be a bad assumption."	1 "I am actually happy when the patient has some real reason that I can refer them to a physical therapist. For example, someone who has osteoporosis, or they require a hip replacement, and I can say OK, I am going to refer you to a physical therapist for a rehabilitation program. Insurance will pay for that, or at least pay for a lot of it. They will still have a co-pay..."
Other referrals	1	"I've asked them to go to the internet to see if there is a personal trainer available that they could ask those questions to or to use some information that is out there that they could actually look into those types of things because it is beyond my scope I feel."	2 "I refer people to the YMCA; especially the seniors. They've got the Silver Sneaker program. There's a few other gyms that do it, too. But the YMCA is like in many communities \$25 a month, very affordable and it's very social. You see a lot of people there during the day over 60 that are all working out. And they kind of help each other."

Factors that Increase
Counseling
Confidence

PA knowledge	2	“Having concrete information about the biochemistry of exercise or the guidelines and why – I just find that people respond so much better if you tell them that they have a better chance of controlling their cancer with exercising.”	2	“It just makes it easier to explain how to do exercise when you’re familiar with how to do it, you can tell patients and have an idea of really what you’re telling them to do.”
Simple PA advice	2	“I think in terms of encouraging people to increase their activity and helping them identify activities that they might enjoy, that they could- and taking baby steps and setting goals, I feel comfortable with that.”	1	

Factors that Decrease
Counseling Confidence

Patients with chronic illness	2	“A long history of illness and they’re debilitated and they need help getting strong enough to do the things they could do to help them... I would not be comfortable counseling that patient.”	2	“Where I lose a little bit of that confidence is in patients with...cardiovascular compromise and things like that where I feel like we need to get a cardiologist on board to approve or to clear them for certain activity.”
Fear of injury to the patient	2	“I’d feel bad if I tell one of my elderly patients to walk and then they have a fall with a fracture, or something like that.”	2	“That they're going to go ahead and be successful and that you're not causing them more harm than good. Because there's the oath that we all swore to. And so it's kind of like, yeah, there's a medical/legal and that's wonderful but there's also the moral obligation that you say, “Oh gosh, they have cardiac I don't want to kill them.”
Provision of expert advice	2	“If someone is inactive try to get them to think of ways that they could increase their physical activity. I think all of us, physicians, feel comfortable with that. But I have specific questions with people who are already exercising and those types of things, it gets a	0	

little outside of at least my realm.”

Table 12
Summary of Barriers to Physical Activity Counseling

Key Themes	Nurse Practitioners (n=3)		Physician Assistants (n=2)	
	n	Illustrative quotations	n	Illustrative quotations
Barriers				
More important things to discuss	3	“Most of what I do is internal medicine, so when I see a patient, usually we have more important things to deal with and I don’t have the time allotted to talk to them about physical activity, we have to worry about oxygen and their prednisone and all of those things first.”	2	“When you have patients taking their insulin wrong or they’re not taking pills, I feel like we have to beat our heads against the wall to convince them that they need to take their medications... and then now we’ve spent 25 minutes in their room explaining them how they’re supposed to take their insulin and there’s not really any time for exercise counseling.”
Lack of time	2	“There is no time, there’s just no time.”	2	“We see 20 to 30 patients a day in 15 minute visits and you can really only safely take care of 1 to 2 problems a day and they wait til everything’s really bad to come in just because the idea of preventive medicine has not been ingrained in them.”
Healthcare system	2	“Our system is set up not really for health promotion, but for treatment of illness... if they can spend some dollars on prevention, then they’re going to spend less dollars on treatment and hospitalizations. The health system as a whole is not set up for that.”	1	“They should roll that cardiac ball through the remainder of medicine. Why is it only cardiac rehab? Can’t it be obesity rehab, or gastric bypass rehab, or transplantation rehab, or surgery rehab? Why can’t we roll that model through, and have it get paid for everybody?”
Lack of reimbursement	2	“With the physical therapy, you know if someone has a goal, or is training for some event or something, you can’t get reimbursement for that. You can get reimbursement for rehab for an injury or related to a condition but not for just increasing activity- I don’t think you can get reimbursement for that.”	2	“No insurance is going to cover a personal trainer.... I don’t see that happening because you also have to have a gym membership for that.”
Perceived patient financial barriers	2	“But some people cannot afford that- people afford personal trainers. Like I feel bad- I see a huge Medicaid population. I can’t tell people “oh go	2	“I do have a cardiac rehab that I can utilize, and that is three times a week. But the patient still has to come up with \$30 a visit, and then the insurance

see a personal trainer.” I mean I can’t tell people things like that.”

will cover the rest. You have Medicare patients, who frequently are the ones I am sending, and that is \$90 a week that they do not have to spend. And so that part of it is frustrating.”

Table 13
Summary of Counseling Knowledge, Perceived Usefulness of “Exercise is Medicine,” and Desired Delivery Methods of Additional Physical Activity Training

Key Themes	Nurse Practitioners (n=3)		Physician Assistants (n=2)	
	n	Illustrative quotations	n	Illustrative quotations
PA Recommendation Knowledge	3	“So I have to say I know what they are generally, I couldn’t say these are like, the ADA guidelines, these are the American Heart Association, these are the surgeon general. Cause some are like 20 minutes most day, some are 30 minutes most days, so I default to the longer time, some say most days, some same 3 days a week”	2	“I think I would know what they would say, but I don’t think I...just sitting here could say.”
Sources of PA Knowledge				
HCP program	3	“I’m thinking about when I first learned about physical activity. When I went to the nurse practitioner program...it was in the 80’s. We didn’t have prescriptive privileges so our classes were initially health promotion, health maintenance, health restoration. We spent a lot of time on promoting health.”	2	“I’m trying to remember, I know we had- they put a lot of emphasis on the diabetic guidelines and that includes I don’t know, don’t remember but the 30 minutes a day moderate exercise, for more days than not...So it was mostly in conjunction with hypertension, diabetes, you know the things that are most affected by sedentary lifestyles.”
Lack of training in HCP program	2	“In my program we didn’t really get anything and so it’s really more like what you can get from what the average person does from reading about it or exercising yourself.”	2	“When I went through my PA program, they didn’t have anything on exercise.”
Reading/online sources	3	“I’m very lucky where I work, because we have Internet in every office. And so I can pull up some great support websites to show them, if they want to join a blog or something to that effect, which is kind of nice. You’d be surprised. I’m noticing the younger set really like that. My older sets are more in tune of just give me the factual information. Just where can I go to get some good tips.”	1	“Mostly self study. I read all kinds of topics, and it’s discussion, mostly, on the web.”

Training unrelated to HCP program	1	I also in my undergrad work, many, many moons ago, took an exercise physiology class which was interesting.”	2	“My undergraduate was in exercise science/kinesiology.”
Fitness professionals	2	“I know I’ve gained some information from personal trainers.”	2	“I have a good background of athletics and in college I was trained by the college trainers.”
EIM Initiative				
Perceived usefulness	2	“I do think sometimes you say things sort of off handedly or even discuss it, ‘Oh I’d like to see you walking, to start 10 minutes a day.’ Maybe writing it down would give more validity to it. You know, I’m trying to think, personally, if I went for my yearly physical and my doctor handed me this and said ‘This is what I’d like your goal to be with exercise’ maybe it would have more impact.”	2	There isn't any specialty that wouldn't apply to this... Neurology, family practice, pediatrics, surgery, anything. I mean they've got the answers to the questions that people ask all the time. Exercising with hearing loss. [referring to the EIM health flier series]. I've never seen anything written on that in my life. And I actually plan to go onto this website and look at all of these as soon as humanly possible.”
Perceived concerns	2	“When you say prescription, to me that indicates, um, guide, it indicates directions and insurance covering it. So I’m not sure what this really means.”	2	“For writing prescriptions I think we’d need more help cause here’s just more to take into consideration than back to the whole out of control diabetic with cardiac problems, I’m not so sure that I’m the one who is appropriate to write them a prescription for exercise.”
Desired Delivery of Counseling-Related Training Conferences	2	“If I go to a conference, I have lots of interest in being there and I find those informational meetings that fit my needs. And so if there are meetings regarding how to disseminate information on lifestyle changes and how to get people to commit and follow through in a supportive environment and different ideas about that, I get more from the brain melt, that think tank. And I like doing it with other people that have the shared expertise.”	1	“I think at a national conference if they were to have one of these as a CME credit that it would be highly attended.”

In-service	1	“I feel that, you know, when you share your successes and your defeats together in a supportive, safe group where everything stays within the confines of a well established group. And we share this vision in terms of bringing in people that have their different expertise and having small groups.”	1	“I think that it would be helpful to have hands-on materials that are simple, un delivered in an oral and demonstrative format.”
Online	2	“I love the internet.”	1	“I think web-based would be the best. Because even getting this group together. It was difficult because of time commitment and flexibilities especially for physician assistants when they are on call and everything. It's pretty difficult to probably accommodate... schedules.”

References

- Buchholz, S. W., & Purath, J. (2007). Physical activity and physical fitness counseling patterns of adult nurse practitioners. *Journal of the American Academy of Nurse Practitioners, 19*, 86-92. doi:10.1111/j.1745-7599.2006.00197.x
- Burns, K. J., Camaione, D. N., & Chatterton, C. T. (2000). Prescription of physical activity by adult nurse practitioners: A national survey. *Nursing Outlook, 48*, 28-33. doi:10.1067/mno.2000.99101
- Douglas, F., Torrance, N., van Teijlingen, E., Meloni, S., & Kerr, A. (2006). Primary care staff's views and experiences related to routinely advising patients about physical activity. A questionnaire survey. *BMC Public Health, 6*, 138-148. doi:10.1186/1471-2458-6-138
- Dympna, C. (2007). Nurses' perceptions, understanding and experiences of health promotion. *Journal of Clinical Nursing, 16*, 1039-1049. Retrieved from <http://www.wiley.com.ezproxy1.lib.asu.edu/WileyCDA/>
- Everett, C. M., Schumacher, J. R., Wright, A., & Smith, M. A. (2009). Physician assistants and nurse practitioners as a usual source of care. *Journal of Rural Health, 25*, 407-414. doi:10.1111/j.1748-0361.2009.00252.x
- ExerciseIsMedicine.org. (n.d.) Health care providers' action guide. Retrieved March 17, 2011, from http://exerciseismedicine.org/documents/HCProActionGuide_HQ
- Haskell, W. L., Lee, I., Pate, R. R., Powell, K. E., Blair, S. N., Franklin, B. A., ... Bauman, A. (2007). Physical activity and public health: Updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Medicine & Science in Sports & Exercise, 39*, 1423-1434. doi:10.1249/mss.0b013e3180616b27
- Hooker, R. S. (2006). Physician assistants and nurse practitioners: the United States experience. *Medical Journal of Australia, 185*, 4-7.
- Institute of Medicine of the National Academies [IOM]. (2010). The future of nursing: Leading change, advancing health. Retrieved March 17, 2011, from <http://www.iom.edu/Reports/2010/The-Future-of-Nursing-Leading-Change-Advancing-Health>
- Jonas, S., & Phillips, E. M. (Eds.). (2009). *ACSM's Exercise is Medicine. A clinician's guide to exercise prescription*. Philadelphia, PA: Lippincott Williams & Wilkins.

- Lambe, B., & Collins, C. A. (2010). A qualitative study of lifestyle counselling in general practice in Ireland. *Family Practice*, 27, 219-223.
doi:10.1093/fampra/cmp086
- Lincoln, Y. & Guba, E. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.
- McDowell, N., McKenna, J., & Naylor, P-J. (1997). Factors that influence practice nurses to promote physical activity. *British Journal of Sports Medicine*, 31, 308-313. doi:10.1136/bjism.31.4.308
- Melillo, K. D., Houde, S. C., Williamson, E., & Futrell, M. (2000). Perceptions of nurse practitioners regarding their role in physical activity and exercise prescription for older adults. *Clinical Excellence for Nurse Practitioners*, 42(2), 108-116.
- Petrella, R. J., & Lattanzio, C. N. (2002). Does counseling help patients get active? Systematic review of the literature. *Canadian Family Physician*, 48, 72-80. Retrieved from
<http://www.cfp.ca/content/vol48/issue1/index.dtl>
- Sallis, J. F. (2009). Exercise is medicine and physicians need to prescribe it! *British Journal of Sports Medicine*, 43, 3-4.
doi:10.1136/bjism.2008.054825
- Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22, 63-75. Retrieved from
<http://iospress.metapress.com/content/3ccttm2g59cklapx/?p=1dc0853516d0424baa3147a00c250f29&pi=0>
- Sherman, S. E., & Hershman, W. Y. (1993). Exercise counseling: How do general internists do? *Journal of General Internal Medicine*, 8, 243-248.
doi:10.1007/BF02600089
- Strauss, A. L., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory, procedures and techniques* (2nd ed.). Newbury Park, CA: Sage Publications.
- Tompkins, T. H., Belza, B., & Brown, M-A. (2009). Nurse practitioner practice patterns for exercise counseling. *Journal of the American Academy of Nurse Practitioners*, 21, 79-86. doi:10.1111/j.1745-7599.2008.00388.x
- Tulloch, H., Fortier, M., & Hogg, W. (2006). Physical activity counseling in primary care: Who has and who should be counseling? *Patient Education and Counseling*, 64, 6-20. doi:10.1016/j.pec.2005.10.010

- U. S. Department of Health and Human Services [USDHHS]. (2009). Developing Healthy People 2020. Washington, DC: U. S. Department of Health and Human Services, Office of the Disease Prevention and Health Promotion; 2009. Retrieved December 12, 2010, from <http://www.healthypeople.gov>
- U. S. Department of Health and Human Services [USDHHS]. (1996). Physical activity and health: A report of the Surgeon General. Atlanta, Georgia: U. S. Department of Health and Human Services, Centers for Disease Control and Prevention. Retrieved November 11, 2008, from <http://www.cdc.gov/nccdphp/sgr/contents.htm>.
- U. S. Department of Health and Human Services [USDHHS]. (2008). Physical activity guidelines for Americans. Atlanta, GA: US Department of Health and Human Services, Office of the Surgeon General. Retrieved July 7, 2009, from <http://www.health.gov/paguidelines>
- Walsh, J. M. E., Swangard, D. M., Davis, T., & McPhee, S. J. (1999). Exercise counseling by primary care physicians in the era of managed care. *American Journal of Preventive Medicine*, *16*, 307-313.
doi:10.1016/S0749-3797(99)00021-5

Chapter 6

CONCLUSIONS

Chronic diseases, such as cardiovascular disease, diabetes, and arthritis, are serious health problems affecting the U.S. population. Regular participation in PA is an important factor in the prevention and management of chronic disease including cardiovascular disease and diabetes (USDHHS, 1996). Lifestyle counseling during managed care has been shown to successfully increase PA health behaviors among patients (Calfas et al., 1996; Grandes et al., 2009; Lawlor & Hanratty, 2001; Lewis & Lynch, 1993; Pinto, Goldstein, DePue, et al., 1998). Several professional organizations endorse the provision of PA counseling by HCPs including the American College of Preventive Medicine, the American Academy of Family Physicians, the American Academy of Pediatrics, the American College of Obstetrics and Gynecology, the American Heart Association, National Institutes of Health, and the Surgeon General (Garry et al., 2002; Jacobson et al., 2005; Sallis, 2009).

The ACSM Exercise is Medicine initiative calls for all clinicians, not just licensed physicians to prescribe PA to patients as needed and appropriate at every visit (Jonas & Phillips, 2009). Motivation is a key component in beginning to become more physically active. The Exercise is Medicine approach recognizes this and aims for HCPs to aid in mobilizing patient motivation (Jonas & Phillips, 2009). In 2002, the U. S. Preventive Services Task Force concluded that "evidence is insufficient to recommend for or against behavioral counseling in primary care settings to promote physical activity." Jonas and Phillips (2009)

suggest that this lack of evidence may be due to the lack of effective education and training on the part of HCPs to adequately provide PA counseling.

These two studies are the first to examine the PA counseling practices of both NPs and physician assistants. Together, these studies sought to determine the prevalence of PA counseling, perceived knowledge and confidence to counseling, sources of knowledge to counsel, education training related to PA counseling, interest in the ACSM Exercise is Medicine initiative, and potential similarities and differences in these factors between NPs and physician assistants.

The first study (Chapter 4) examined the prevalence of PA counseling practices, perceived knowledge and confidence to provide PA counseling, the educational training related to PA counseling and the potential differences in these factors between NPs and physician assistants. Results of this cross-sectional study found that the majority of participants reported providing PA counseling with no differences between NPs and physician assistants for perceived knowledge or confidence to provide PA counseling. The majority of both NPs (75%) and physician assistants (64%) reported routinely counseling their patients to accumulate 30 minutes of moderate intensity PA on most days of the week suggesting that some type of PA counseling is occurring. Approximately half of all respondents reported receiving no formal training to provide PA counseling. More NPs (76%) than physician assistants (61%; $p < 0.001$) reported an interest in obtaining training to provide PA counseling, primarily through an online curriculum or through attending a workshop at a professional conference. These findings suggest that while NPs and physician assistants are knowledgeable,

confident and currently providing some amount of PA counseling to patients, there is a desire by HCPs to receive additional training to aid in providing PA counseling.

The second study (Chapter 5) further examined and expanded on these components using qualitative methods. Specific objectives included identifying NP and physician assistant (1) current counseling practices, (2) confidence in providing counseling, (3) knowledge of PA and sources of knowledge, (4) familiarity with and perceived usefulness of the "Exercise is Medicine" initiative (Sallis, 2009), (5) the types of information that would aid in PA counseling and how best this information would be delivered, and (6) a qualitative comparison of the similarities and differences between NPs and physician assistants regarding these objectives. Again, these findings indicated that some level of PA counseling is taking place. Having confidence to provide counseling was reported as an important factor for participants to actually provide counseling. It was also found that having appropriate knowledge of PA is associated with increasing PA counseling confidence. Self-reported knowledge of PA was fairly inconsistent among FG participants, again suggesting a need for additional training. While some FG participants reported receiving a small amount of formal PA-related training, several did not and the majority reported a need for and an interest in receiving additional training. Similarly, FG participants reported little, if any familiarity with the ACSM Exercise is Medicine initiative, but reported an interest in learning more about the approach and using it in practice.

Implications

The implications of these findings highlight a need for additional PA-related training consistent with previous research (Garry et al., 2002; Pinto, Goldstein, DePue, et al., 1998; Sherman & Hershman, 1993; Walsh et al., 1999). Sherman and Hershman (1993) reported a perceived lack of effectiveness of counseling or lack of skills needed to counsel as two frequently reported barriers to physician provide PA counseling. In a randomized trial by Pinto, Goldstein, DePue, et al. (1998), physicians in the intervention group reported improved confidence to provide counseling following a 1-hour training session. However, this increased confidence was not enough to encourage intervention physicians to counsel all their patients about PA. Therefore, these authors suggest a need for more intensive training for HCPs. In 2002, Garry and colleagues reported that only 13% of U. S. medical schools offer a curriculum in PA and therefore, suggest a need to integrate the PA information and counseling skills into medical school curriculum. Less is known about PA curriculum in nursing or physician assistant programs but there appears to be no standardized curriculum. More recently, in 2010, the IOM issued a report identifying a need for nurses to achieve higher levels of education and training and for nurses to practice to the full extent of their training.

The findings of the present two studies echo these reports. In the first study, approximately half of NPs and physician assistant participants reported receiving some amount of education within their HCP training program. Similarly, within the second study, half of physician assistant FG participants and less than half (36%) of NP FG participants reported receiving training within their

HCP training program. Approximately 70% of participants in each of the present studies reported an interest in receiving additional training. Again, these findings are in line with previous studies of HCPs (McDowell et al., 1997). In the present two studies, the most commonly reported desired delivery methods for such training included online courses with continuing education credits, in-service education, and/or workshops at professional meetings.

Recommendations

Future studies should examine the results of various approaches to and types of PA counseling to identify the most efficient and effective methods of increasing PA counseling in NPs and physician assistants, including online coursework, workshops at professional meetings, in-service events or potentially through curriculum changes within formal training programs for NPs and physician assistants.

Successful interventions utilizing HCPs to deliver PA counseling including have included appropriate PA assessment and tailoring of advice to patient's stage of change for exercise (Jacobson et al., 2005). Future training curriculum for HCPs should include the following topics: current exercise recommendations, exercise screening, exercise prescription, information regarding determining patient's stage of change for readiness to exercise, and strategies to improve patient motivation to exercise.

Additionally, more research is needed regarding the promotion, implementation and best practices of the Exercise Is Medicine initiative by NPs and physicians. As stated previously, the Exercise is Medicine program aims to

have all HCPs asking about PA as a vital sign during appointments and to prescribe exercise as medicine to every patient as appropriate (Jonas & Phillips, 2009; Sallis, 2009). In the present study, the majority of FG participants (n=20; 91%) had not heard of Exercise is Medicine prior to participation in the study. After a brief verbal introduction to the program and a few minutes of looking over the Health Care Providers Action Guide, all but one FG found that the Exercise is Medicine program or aspects of the program (e.g. Exercise is Medicine health flier series) would be useful in practice. Future studies need to examine the effects of both Exercise is Medicine-specific training for NPs and physician assistants and interventions with these populations using Exercise is Medicine.

Finally, policy changes regarding PA promotion by HCPs are warranted. Two of the top reported barriers to PA counseling by FG participants in the current study included (1) a perception of the healthcare system focus on prescription distribution as opposed to health promotion and disease prevention and (2) lack of reimbursement. This suggests an obstacle to PA promotion that goes beyond a need for provider training. A shift is needed regarding the widespread recognition of the benefits of physical activity, the counseling of physical activity as a medication (Sallis, 2009), and reimbursement of such counseling in health care.

REFERENCES

- American Academy of Nurse Practitioners [AANP]. (n.d.). About Nurse Practitioners. Retrieved September 9, 2009, from <http://aanp.org/AANPCMS2/AboutAANP/About+NPs>
- American Academy of Physician Assistants [AAPA]. (n.d.). American Academy of Physician Assistants Data and Statistics. Retrieved November 19, 2009, from <http://www.aapa.org/about-pas/data-and-statistics>
- Abramson, S., Stein, J., Schaufele, M., Frates, E., & Rogan, S. (2000). Personal exercise habits and counseling practices of primary care physicians: A national survey. *Clinical Journal of Sport Medicine, 10*, 40-48. doi:10.1097/00042752-200001000-00008
- Arizona State Association of Physician Assistants. (n.d.). Arizona State Association of Physician Assistants. Retrieved November 16, 2009, from <http://www.asapa.org/index>
- Arizona State Board of Nursing. (2011, February 22). Daily Arizona Nursing Statistics. Retrieved February 22, 2011, from <http://www.azbn.gov/Default>
- Blair, S. N., Kohl, H. W., Gordon, N. F., & Paffenbarger Jr., R. S. (1992). How much physical activity is good for health? *Annual Review of Public Health, 13*, 99-126. doi:10.1146/annurev.pu.13.050192.000531
- Buchholz, S. W., & Purath, J. (2007). Physical activity and physical fitness counseling patterns of adult nurse practitioners. *Journal of the American Academy of Nurse Practitioners, 19*, 86-92. doi:10.1111/j.1745-7599.2006.00197.x
- Bull, F. C., & Jamrozik, K. (1999). Advice on exercise from a family physician can help sedentary patients to become active. *American Journal of Preventive Medicine, 15*, 85-94. doi:10.1016/S0749-3797(98)00040-3
- Bull, F. C. L., Schipper, E. C. C., Jamrozik, K., & Blanksby, B. A. (1995). Beliefs and behavior of general practitioners regarding promotion of physical activity. *Australian Journal of Public Health, 19*, 300-304. doi:10.1111/j.1753-6405.1995.tb00448.x
- Burns, K. J., Camaione, D. N., & Chatterton, C. T. (2000). Prescription of physical activity by adult nurse practitioners: A national survey. *Nursing Outlook, 48*, 28-33. doi:10.1067/mno.2000.99101

- Calfas, K. J., Long, B. J., Sallis, J. F., Wooten, W. J., Pratt, M., & Patrick, K. (1996). A controlled trial of physician counseling to promote the adoption of physical activity. *Preventive Medicine, 25*, 225-233. doi:10.1006/pmed.1996.0050
- Centers for Disease Control and Prevention [CDC]. (2007, November 23). Prevalence of regular physical activity among adults -- United States, 2001 and 2005. *Morbidity and Mortality Weekly Report, 56*, 1209-1212. Retrieved November 23, 2008, from <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5646a1.htm>
- Connaughton, A. V., Weiler, R. M., & Connaughton, D. P. (2001). Graduating medical students' exercise prescription competence as perceived by deans and directors of medical education in the United States: Implications for Healthy People 2010. *Public Health Reports, 116*, 226-234. doi:10.1016/S0033-3549(04)50038-9
- Douglas, F., Torrance, N., van Teijlingen, E., Meloni, S., & Kerr, A. (2006). Primary care staff's views and experiences related to routinely advising patients about physical activity. A questionnaire survey. *BMC Public Health, 6*, 138-148. doi:10.1186/1471-2458-6-138
- Dympna, C. (2007). Nurses' perceptions, understanding and experiences of health promotion. *Journal of Clinical Nursing, 16*, 1039-1049. Retrieved from <http://www.wiley.com.ezproxy1.lib.asu.edu/WileyCDA/>
- Eden, K. B., Orleans, T., Mulrow, C. D., Pender, N. J., & Teutsch, S. M. (2002). Does counseling by clinicians improve physical activity? A summary of the evidence for the U. S. Preventive Services Task Force. *Annals of Internal Medicine, 137*, 208-215. Retrieved from <http://www.acponline.org.ezproxy1.lib.asu.edu/journals/annals/annaltoc.htm>
- Elley, C., Kerse, N., Arroll, B., & Robinson, E. (2003). Effectiveness of counseling patients on physical activity in general practice: cluster randomized controlled trial. *British Medical Journal, 326*, 793-799. doi:10.1136/bmj.326.7393.793
- Everett, C. M., Schumacher, J. R., Wright, A., & Smith, M. A. (2009). Physician assistants and nurse practitioners as a usual source of care. *Journal of Rural Health, 25*, 407-414. doi:10.1111/j.1748-0361.2009.00252.x
- ExerciseIsMedicine.org. (n.d.) Health care providers' action guide. Retrieved March 17, 2011, from http://exerciseismedicine.org/documents/HCProActionGuide_HQ

- Frank, E., Tong, E., Lobelo, F., Carrera, J., & Duperly, J. (2008). Physical activity levels and counseling practices of U. S. medical students. *Medicine & Science in Sports & Exercise*, *40*, 413-421.
doi:10.1249/MSS.0b013e31815ff399
- Garry, J. P., Diamond, J. J., & Whitley, T. W. (2002). Physical activity curricula in medical schools. *Academic Medicine*, *77*, 818-821.
doi:10.1097/00001888-200208000-00011
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory*. Chicago, IL: Aldine.
- Goldstein, M. G., Pinto, B. M., Marcus, B. H., Lynn, H., Jette, A. M., Rakowski, W., ... Tennstedt, S. (1999). Physician-based physical activity counseling for middle-aged and older adults: A randomized trial. *Annals of Behavioral Medicine*, *21*, 40-47. doi:10.1007/BF02895032
- Graham-Clarke, P., & Oldenburg, B. (1994). The effectiveness of a general-practice based physical activity intervention on patient physical activity status. *Behaviour Change*, *11*, 132-144.
- Grandes, G., Sanchez, A., Sanchez-Pinilla, R. O., Ortega, R., Torcal, J., Montoya, I., ... Serra, J. (2009). Effectiveness of physical activity advice and prescription by physicians in routine primary care. A cluster randomized trial. *Archives of Internal Medicine*, *169*(7), 694-701.
doi:10.1001/archinternmed.2009.23
- Harland, J., White, M., Drinkwater, C., Chinn, D., Farr, L., & Howel, D. (1999). The Newcastle exercise project: A randomised controlled trial of methods to promote physical activity in primary care. *British Medical Journal*, *319*, 828-832. Retrieved from <http://www.jstor.org/stable/i25185866>
- Haskell, W. L., Lee, I., Pate, R. R., Powell, K. E., Blair, S. N., Franklin, B. A., ... Bauman, A. (2007). Physical activity and public health: Updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Medicine & Science in Sports & Exercise*, *39*, 1423-1434. doi:10.1249/mss.0b013e3180616b27
- Hillsdon, M., Thorogood, M., White, I., & Foster, C. (2002). Advising people to take more exercise is ineffective: A randomized controlled trial of physical activity promotion in primary care. *International Journal of Epidemiology* *31*, 808-815. doi:10.1093/ije/31.4.808
- Hooker, R. S. (2006). Physician assistants and nurse practitioners: the United States experience. *Medical Journal of Australia*, *185*, 4-7.

- Imperial Cancer Research Fund OXCHECK Study Group [OXCHECK]. (1995). Effectiveness of health checks conducted by nurses in primary care: Final results of the OXCHECK study. *British Medical Journal*, 310, 1099-1104. Retrieved from <http://www.jstor.org/stable/i25185866>
- Institute of Medicine of the National Academies [IOM]. (2008). The health care workforce for older Americans: Promoting team care. Washington, D. C.: National Academies Press. Retrieved February 26, 2011, from <http://www.iom.edu/Activities/Workforce/agingamerica/2008-OCT-07>
- Institute of Medicine of the National Academies [IOM]. (2010). The future of nursing: Leading change, advancing health. Retrieved March 17, 2011, from <http://www.iom.edu/Reports/2010/The-Future-of-Nursing-Leading-Change-Advancing-Health>
- Jacobson, D. M., Strohecker, L., Compton, M. T., & Katz, D. L. (2005). Physical activity counseling in the adult primary care setting. Position statement of the American College of Preventive Medicine. *American Journal of Preventive Medicine*, 29, 158-162. doi:10.1016/j.amepre.2005.04.009
- Jimmy, G., & Martin, B. W. (2005). Implementation and effectiveness of a primary care based physical activity counselling scheme. *Patient Education and Counseling*, 56, 323-331. doi:10.1016/j.pec.2004.03.006
- Jonas, S., & Phillips, E. M. (Eds). (2009). *ACSM's Exercise is Medicine. A clinician's guide to exercise prescription*. Philadelphia, PA: Lippincott Williams & Wilkins.
- Kaiser Family StateHealthFacts.org. (2010). Arizona: Non-physician providers. Retrieved February 22, 2011, from <http://www.statehealthfacts.org/index>
- Kastarinen, M. J., Puska, P. M., Korhone, M. H., Mustonen, J. N., Salomaa, V. V., & Sundvall, J. E. (2002). Non-pharmacological treatment of hypertension in primary health care: A 2-year open randomized controlled trial of lifestyle intervention against hypertension in eastern Finland. *Journal of Hypertension*, 20, 2505-2512. doi:10.1097/00004872-200212000-00031
- Kelly, R. B. (1988). Controlled trial of a time-efficient method of health promotion. *American Journal of Preventive Medicine*, 4, 200-207.
- Kerse, N., Elley, C. R., Robinson, E., Arroll, B. (2005). Is physical activity counseling effective for older people? A cluster randomized, controlled

trial in primary care. *Journal of the American Geriatric Society*, 53, 1951-1956.

- King, A. C., Sallis, J. F., Dunn, A. L., Simons-Morton, D. G., Albright, C. A., Cohen, S., ... Coday, M. C. (1998). Overview of the activity counseling trial (ACT) intervention for promoting physical activity in primary health care settings. *Medicine & Science in Sports & Exercise*, 30, 1086-1096. doi:10.1097/00005768-199807000-00011
- Lambe, B., & Collins, C. A. (2010). A qualitative study of lifestyle counselling in general practice in Ireland. *Family Practice*, 27, 219-223. doi:10.1093/fampra/cmp086
- Lawlor, D. A., & Hanratty, B. (2001). The effect of physical activity advice given in routine primary care consultations: A systematic review. *Journal of Public Health Medicine*, 23, 219-226. doi:10.1093/pubmed/23.3.219
- Lawlor, D. A., Keen, S., & Neal, R. D. (1999). Increasing population levels of physical activity through primary care: GPs' knowledge, attitudes and self-reported practice. *Family Practice*, 16, 250-254. doi:10.1093/fampra/16.3.250
- Lewis, B. S., & Lynch, W. D. (1993). The effect of physician advice on exercise behavior. *Preventive Medicine*, 22, 110-121. doi:10.1006/pmed.1993.1008
- Lincoln, Y. & Guba, E. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.
- Little, P., Dorward, M., Gralton, S., Hammerton, L., Pillinger, J., & White, P. (2004). A randomised controlled trial of three pragmatic approaches to initiate increased physical activity in sedentary patients with risk factors for cardiovascular disease. *British Journal of General Practice*, 54, 189-195. Retrieved from <http://www.ncbi.nlm.nih.gov.ezproxy1.lib.asu.edu/pmc/articles/PMC1314829>
- Logsdon, D. N., Lazaro, C. M., & Meier, R. V. (1989). The feasibility of behavior risk reduction in primary medical care. *American Journal of Preventive Medicine*, 5, 249-256.
- Long, B. J., Calfas, K. J., Wooten, W., Sallis, J. F., Patrick, K., Goldstein, M., ... Heath, G. (1996). A multisite field test of the acceptability of physical activity counseling in primary care: Project PACE. *American Journal of Preventive Medicine*, 25, 225-235.

- Marcus, B. H., Goldstein, M. G., Jette, A., Smikin-Silverman, L., Pinto, B. M., Milan, F., ... Dubé, C. E. (1997). Training physicians to conduct physical activity counseling. *Preventive Medicine, 26*, 382-388. doi:10.1006/pmed.1997.0158
- McDowell, N., McKenna, J., & Naylor, P-J. (1997). Factors that influence practice nurses to promote physical activity. *British Journal of Sports Medicine, 31*, 308-313. doi:10.1136/bjism.31.4.308
- Melillo, K. D., Houde, S. C., Williamson, E., & Futrell, M. (2000). Perceptions of nurse practitioners regarding their role in physical activity and exercise prescription for older adults. *Clinical Excellence for Nurse Practitioners, 42*(2), 108-116.
- Mittman, D. E., Cawley, J. F., & Fenn, W. H. (2002). Physician assistants in the United States. *British Medical Journal, 32*, 485-487. doi:10.1136/bmj.325.7362.485
- Morgan, D. L. (1998). *Planning Focus Groups*. Thousand Oaks, CA: Sage Publications.
- Norris, S. L., Grothaus, L. C., Bucner, D. M., & Pratt, M. (2000). Effectiveness of physician-based assessment and counseling for exercise in a staff model HMO. *Preventive Medicine, 30*, 513-523. doi:10.1006/pmed.2000.0673
- QSR International. (n.d.). NVIVO 8 Home. Retrieved January 27, 2010, from <http://www.qsrinternational.com/products.aspx>
- Patrick, K., Sallis, J. F., Long, B., Calfas, K. J., Wooten, W., Heath, G., & Pratt, M. (1994). A new tool for encouraging activity. *The Physician and Sportsmedicine, 22*(11), 45-52.
- Pearson, L. J. (2009). The Pearson Report. *The American Journal for Nurse Practitioners, 13*(6), 17. Retrieved from <http://www.pearsonreport.com/>
- Petrella, R. J., Koval, J. J., Cunninham, D. A., & Paterson, D. H. (2003). Can primary care doctors prescribe exercise to improve fitness? The step test exercise prescription (STEP) project. *American Journal of Preventive Medicine, 24*, 316-322. doi:10.1016/S0749-3797(03)00022-9
- Petrella, R. J., & Lattanzio, C. N. (2002). Does counseling help patients get active? Systematic review of the literature. *Canadian Family Physician, 48*, 72-80. Retrieved from <http://www.cfp.ca/content/vol48/issue1/index.dtl>

- Pfeiffer, B. A., Clay, S. W., & Conatser Jr., R. R. (2001). A green prescription study: Does written exercise prescribed by a physician result in increased physical activity among older adults? *Journal of Aging and Health, 13*, 527-538. doi:10.1177/089826430101300405
- Pinto, B. M., Goldstein, M. G., DePue, J. D., & Milan, F. B. (1998). Acceptability and feasibility of physician-based activity counseling. The PAL project. *American Journal of Preventive Medicine, 15*, 95-102. doi:10.1016/S0749-3797(98)00043-9
- Pinto, B. M., Goldstein, M. G., & Marcus, B. H. (1998). Activity counseling by primary care physicians. *Preventive Medicine, 27*, 506-513. doi:10.1006/pmed.1998.0335
- Pratt, M., Macera, C. A., & Wang, G. (2000). Higher direct medical costs associated with physical inactivity. *The Physician and Sportsmedicine, 28*, 63-70. doi:10.3810/psm.2000.10.1237
- Roderick, P., Ruddock, V., Hunt, P., & Miller, G. (1997). A randomized trial to evaluate the effectiveness of dietary advice by practice nurses in lowering diet-related coronary heart disease risk. *British Journal of General Practice, 47*, 7-11. Retrieved from <http://www.ncbi.nlm.nih.gov.ezproxy1.lib.asu.edu/pmc/articles/PMC1312885>
- Rogers, L. Q., Bailey, J. E., Gutin, B., Johnson, K. C., Levine, M. A., Milan, F., ... Sherman, S. E. (2002). Teaching resident physicians to provide exercise counseling: A needs assessment. *Academic Medicine, 77*, 841-844. doi:10.1097/00001888-200208000-00019
- Sallis, J. F. (2009). Exercise is medicine and physicians need to prescribe it! *British Journal of Sports Medicine, 43*, 3-4. doi:10.1136/bjism.2008.054825
- Sherman, S. E., & Hershman, W. Y. (1993). Exercise counseling: How do general internists do? *Journal of General Internal Medicine, 8*, 243-248. doi:10.1007/BF02600089
- Smith, B. J., Bauman, A. E., Bull, F. C., Booth, M. L., & Harris, M. F. (2000). Promoting physical activity in general practice: a controlled trial of written advice and information materials. *British Journal of Sports Medicine, 34*, 262-267. doi:10.1136/bjism.34.4.262
- Steptoe, A., Doherty, S., Rink, E., Kerry, S., Kendrick, T., Hilton, S. (1999). Behavioural Counselling in General Practice for the Promotion of Healthy


Behaviour among Adults at Increased Risk of Coronary Heart Disease: Randomised Trial. *British Medical Journal*, 319, 943-947. Retrieved from <http://www.jstor.org/stable/i25186003>

- Strauss, A. L., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory, procedures and techniques* (2nd ed.). Newbury Park, CA: Sage Publications.
- Swinburn, B. A., Walter, L. G., Arroll, B., Tilyard, M. W., & Russell, D. G. (1998). The Green Prescription Study: A randomized controlled trial of written exercise advice provided by general practitioners. *American Journal of Public Health*, 88, 288-291. doi:10.2105/AJPH.88.2.288
- Tompkins, T. H., Belza, B., & Brown, M-A. (2009). Nurse practitioner practice patterns for exercise counseling. *Journal of the American Academy of Nurse Practitioners*, 21, 79-86. doi:10.1111/j.1745-7599.2008.00388.x
- Tulloch, H., Fortier, M., & Hogg, W. (2006). Physical activity counseling in primary care: Who has and who should be counseling? *Patient Education and Counseling*, 64, 6-20. doi:10.1016/j.pec.2005.10.010
- U. S. Department of Health and Human Services [USDHHS]. (2009). Developing Healthy People 2020. Washington, DC: U. S. Department of Health and Human Services, Office of the Disease Prevention and Health Promotion; 2009. Retrieved December 12, 2010, from <http://www.healthypeople.gov>
- U. S. Department of Health and Human Services [USDHHS]. (1996). Physical activity and health: A report of the Surgeon General. Atlanta, Georgia: U. S. Department of Health and Human Services, Centers for Disease Control and Prevention. Retrieved November 11, 2008, from <http://www.cdc.gov/nccdphp/sgr/contents.htm>.
- U. S. Department of Health and Human Services [USDHHS]. (2008). Physical activity guidelines for Americans. Atlanta, GA: US Department of Health and Human Services, Office of the Surgeon General. Retrieved July 7, 2009, from <http://www.health.gov/paguidelines>
- van der Ploeg, H. P., Smith, B. J., Stubbs, T., Vita, P., Holford, R., & Bauman, A. E. (2007). Physical activity promotion. Are GPs getting the message? *Australian Family Physician*, 36, 871-874.
- Vickers, K. S., Kircher, K. J., Smith, M. D., Petersen, L. R., & Rasmussen, N. H. (2007). Health behavior counseling in primary care: Provider-reported rate and confidence. *Family Medicine*, 39, 730-735. Retrieved from <http://www.stfm.org/fmhub/fm2007/November>

- Walsh, J. M. E., Swangard, D. M., Davis, T., & McPhee, S. J. (1999). Exercise counseling by primary care physicians in the era of managed care. *American Journal of Preventive Medicine, 16*, 307-313. doi:10.1016/S0749-3797(99)00021-5
- Wells, K. B., Lewis, C. E., Leake, B., Schleiter, M. K., & Brook, R. H. (1986). The practices of general and subspecialty internists in counseling about smoking and exercise. *American Journal of Public Health, 76*, 1009-1013. doi:10.2105/AJPH.76.8.1009
- Whitlock, E. P., Orleans, T., Pender, N., & Allan, J. (2002). Evaluating primary care behavioral counseling interventions. An evidence-based approach. *American Journal of Preventive Medicine, 22*, 267-284. doi:10.1016/S0749-3797(02)00415-4
- Writing Group for the Activity Counseling Trial Research Group. (2001). Effects of physical activity counseling in primary care. The Activity Counseling Trial: A randomized controlled trial. *Journal of American Medical Association, 286*, 677-687. doi:10.1001/jama.286.6.677



APPENDIX A

CHAPTER 4 IRB APPROVAL, RECRUITMENT MATERIALS,
INFORMATION LETTER, AND STUDY QUESTIONNAIRE



Office of Research Integrity and Assurance

To: Cheryl Der Ananian

From:  Mark Roosa, Chair 
Soc Beh IRB

Date: 05/15/2009

Committee Action: Exemption Granted

IRB Action Date: 05/15/2009

IRB Protocol #: 0904003908

Study Title: Physical Activity Counseling Curriculum for Nurse Practitioners Focus Groups

The above-referenced protocol is considered exempt after review by the Institutional Review Board pursuant to Federal regulations, 45 CFR Part 46.101(b)(2) .

This part of the federal regulations requires that the information be recorded by investigators in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. It is necessary that the information obtained not be such that if disclosed outside the research, it could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

You should retain a copy of this letter for your records.

From: Susan Metosky
Sent: Wed 2/24/2010 11:43 AM
To: Cheryl Der Ananian; Megan Grimstedt
Subject: RE: Question regarding amendment to IRB #0904003908

Cheryl,

Thank you for the email. As long as the change does not alter the exempt status no formal paperwork is required. I would be happy to review the questions. However, if they are anonymous and along the same lines as what is in the focus groups that will not alter the exempt status. Adding 260 participants who are 18 and older would not alter the exempt status.

Susan

From: Cheryl Der Ananian
Sent: Wednesday, February 24, 2010 11:36 AM
To: Susan Metosky; Megan Grimstedt
Subject: RE: Question regarding amendment to IRB #0904003908

Hi Susan,

I would just like a clarification of the email below so that Megan and I do not encounter any problems later. Is it correct that we do not need to submit an IRB amendment even though she is adding an online survey component and an additional 260 participants? The online survey was not included in her initial IRB application and I don't want her to have any problems down the road. I know she will need to create a cover letter for the online questionnaire. Does the IRB need to see this prior to using it?

I apologize for my questions. The research experience I have had at other universities has required IRB approval for amendments even if the study was exempt. They had to have a paper trail. Please advise.

Thank you.

Cheryl

Subject line: Chance to Win \$50 gift card! Survey of Physician Assistants!

Hello:

My name is Megan Grimstvedt and I am a doctoral candidate in the Exercise and Wellness Program at Arizona State University. I am recruiting physician assistants to complete an online survey for the chance to win one of four \$50 gift cards. The aim of this study is to better understand physical activity counseling practices, confidence to counsel physical activity, and the types of information about physical activity counseling that would be most useful to physician assistants. The survey should take approximately 20 minutes and is completed entirely online. Upon completion of the survey, participants will be asked for contact information to be entered in a drawing for one of four \$50 gift cards. Contact information will not be linked to questionnaire responses. The link for participation is <https://www.surveymonkey.com/s/TWKH29N>
Please contact me at mgrimstv@asu.edu or (480) 297-5303 if you have any questions or concerns. Thank you in advance for your participation! And please pass this on to your physician assistant colleagues.

Sincerely,
Megan Grimstvedt, M. A.
Doctoral Candidate and Teaching Associate
Exercise and Wellness Program
College of Nursing and Health Innovation
Arizona State University
7350 East Unity Avenue
Mesa, AZ 85212
Phone: 480 727-1945
Fax: 480 727-1051
E-mail: mgrimstv@asu.edu

Nurse Practitioner Questionnaire



**Are you a Nurse Practitioner?
If so, we need your help!
*Chance to win \$50!***

- * **Purpose of the this study** is to better understand physical activity counseling knowledge and behavior, confidence to counsel for physical activity, and the type of information about physical activity counseling that would be most useful to nurse practitioners and the best methods for disseminating this information.
- * Participation is open to **any practicing nurse practitioner** working in a facility where physical activity counseling would be appropriate.
- * Takes approximately **20 minutes or less**.
- * **Chance to win one of four \$50 Target gift cards for participation!**
- * If you would like to participate, please visit the following link: **<https://www.surveymonkey.com/s/TWKH29N>**

Physician Assistant Questionnaire



Are you a Physician Assistant?

If so, we need your help!



- Purpose of the questionnaire is to more accurately understand physician assistants' current physical activity knowledge and counseling behavior and the best methods for disseminating information about physical activity to physician assistants.
- Participation is open to any practicing physician assistants in Arizona working in a field that would allow for physical activity counseling (e.g. family practice, internal medicine).
- The questionnaire should take approximately 20 minutes or less.
- Chance to win one of four \$50 gift cards for participation!
- If you would like to participate please visit the following link: <https://www.surveymonkey.com/s/TWKH29N>

INFORMATION LETTER

The Promotion of Physical Activity by Health Practitioners Questionnaire

Dear Participant:

I am a graduate student under the direction of Assistant Professor Cheryl Der Ananian in the College of Nursing and Health Innovation, Exercise and Wellness Program at Arizona State University.

We are conducting a research study to determine the physical activity assessment and counseling practices, confidence in counseling practices, and to determine educational training related to physical activity counseling of nurse practitioners' and physician assistants. I am inviting your participation in completing an online questionnaire consisting of 34 questions. Participation time is expected to take approximately 20 minutes.

Your participation in this study is voluntary. You can skip questions if you wish. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. To participate, we ask that you be an employed nurse practitioner or physician assistant practicing in a facility where physical activity counseling would be appropriate and applicable.

For your participation you will be entered into a drawing to receive one of four \$50 Target gift cards. Your participation will help to determine the prevalence of physical activity counseling, perceived knowledge and confidence in physical activity counseling, and educational training related to physical activity counseling.

There are no foreseeable risks or discomforts to your participation.

Your responses will be anonymous. The results of this study may be used in reports, presentations, or publications but your name will not be used nor will not be linked to any responses.

If you have any questions concerning the research study, please contact the research team: Megan Grimstvedt (mgrimstv@asu.edu) or Dr. Cheryl Der Ananian (cheryld@asu.edu) at (480) 727-1945. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

Completion and submission of the survey indicates your consent to participate in this study.

Sincerely,

Megan Grimstvedt, MA

Promotion of Physical Activity by
Health Practitioners Questionnaire

ID Date / /

The purposes of this questionnaire are to:

1. Determine the practice patterns of health practitioners (HPs) regarding the promotion of physical activity and physical fitness for their clients.
2. Assess the perceptions of HPs regarding knowledge and confidence to assess and counsel clients about physical activity and physical fitness.
3. Document educational preparation of HPs regarding the promotion of physical activity.

Instructions:

Please try to answer all the questions. There are no right or wrong answers. You may skip questions you are uncomfortable answering. Please remember that the questionnaire is anonymous. Thank you in advance for completing the questionnaire. Your participation is appreciated.

I. Demographics. Please check your status or fill in the blanks.

1. Age (years)
2. Gender Male Female
3. Occupation Nurse Practitioner Physician Assistant
4. Write in the year you completed each of the following as applicable.

<input type="text"/>	Associate's Degree	___	Please check if not applicable
<input type="text"/>	Diploma	___	Please check if not applicable
<input type="text"/>	BS/BA	___	Please check if not applicable
<input type="text"/>	MS or MA	___	Please check if not applicable
<input type="text"/>	Doctorate	___	Please check if not applicable
<input type="text"/>	NP /PA Certification	___	Please check if not applicable

- 5a. Are you currently practicing as a nurse practitioner or physician assistant? Yes No
 If "yes" please continue with 5b.
 In "no" please go to section V, question #29 and continue with all questions.

- 5b. How many years have you practiced as a nurse practitioner or physician assistant?

ID

II. Practice Description. Please note that the items refer to adult clients.

6. What percent of your practice is devoted to patient teaching or counseling? %

If 0% of your practice is teaching or counseling, please enter 0 and go to question #29 and continue with all questions; if any portion of your practice is teaching or counseling, please continue here with all questions.

7. In which state do you practice?

8. Which best describes your practice locale? Urban (Please choose only one)
 Suburban
 Rural

9. Enter the percent of your clients who are covered by:

<input type="text"/> <input type="text"/> %	Self-pay	<input type="radio"/> Don't Know/Not Sure
<input type="text"/> <input type="text"/> %	Medicare	<input type="radio"/> Refused
<input type="text"/> <input type="text"/> %	Medicaid	
<input type="text"/> <input type="text"/> %	Private Insurance	
<input type="text"/> <input type="text"/> %	Other	

10. In which type of facility do you conduct your primary practice?
 Private Practice (Please choose only one)
 Community Clinic
 Walk-in/intermediate care
 Hospital Clinic
 Emergency Room
 Hospital (Non-emergency room)
 Occupational Clinic
 Other Please specify: _____

11. What is the average age of your clients? years

12. What is the age range of the clients you see in your practice? - years

13. What percent of your clients are?
 Male? % Female? %

ID **III. Practice Patterns.**

As you complete the questions regarding physical activity, please consider the following definitions and descriptions:

Moderate Intensity Physical Activity: Bodily movement that is produced by the contraction of skeletal muscle requiring an energy expenditure of 3 to 6 METS (one MET is equivalent to the resting metabolic rate). A brisk walk at 3 to 4 MPH equals moderate intensity. Other moderate intensity physical activities include gardening, dancing, or home maintenance such as lawn mowing, or washing and waxing a car.

Physically Inactive: Possessing a sedentary lifestyle with NO physical activity beyond basic activities of daily living.

For the following items, please fill in the blanks or check with your choices.

14. Of the clients in your practice who are capable of moderate intensity physical activity, what percent would you estimate to be physically **INACTIVE**?

 %

15. What percent of your clients do you **ASSESS** for physical activity? If you do not assess for physical activity, enter 0.

Percent of all women % Percent of all men %

16. Of the physically **INACTIVE** clients in your practice who are capable of physical activity with and without activity restrictions, what percent do you **COUNSEL** about using physical activity to improve health status? If you do not routinely counsel clients, please enter 0.

Percent of all women % Percent of all men %

If you entered 0% in all four blanks for questions #15 and #16, please go to question #24. If you entered a percent indicating that you do assess or counsel clients about physical activity, please continue.

17. Are there particular client characteristics that prompt you to assess and counsel about physical activity?

- No, I assess and counsel about physical activity regardless of client characteristics
- Yes, the following characteristics prompt me to assess and counsel about physical activity. Please mark all that apply.
- | | |
|---|---|
| <input type="radio"/> Elevated Cholesterol | <input type="radio"/> Obesity |
| <input type="radio"/> Cigarette Smoking | <input type="radio"/> Age, Men > 45 years |
| <input type="radio"/> Hypertension | <input type="radio"/> Age, Women > 55 years |
| <input type="radio"/> Diabetes Mellitus | <input type="radio"/> Other |
| <input type="radio"/> Family History of Heart Disease | Please specify: _____ |
| <input type="radio"/> Physical Inactivity | |

For items 18 through 20, please rank order the options by numbering the one you use most frequently as 1, the one you use second most frequently as 2, etc. You may use as many numbers as are applicable to your practice. Leave blank the items that you do not use. Blanks for all options indicate that you do not perform the activity.

18. What method(s) do you use to determine a client's physical activity level?

- Question client about physical activity
- Measure client's height and weight
- Calculate client's percent body fat
- Ask clients to perform a test of physical performance
- Assess general appearance
- other, please specify _____

19. Of the clients in your practice that you counsel about physical activity, what do you recommend regarding the following physical activity/exercise principles? Please rank by numbering the one you use most frequently as 1, etc.

Frequency of physical activity you advise.

- Once/day
- Several times/day
- Three times/week
- Most days of the week
- Other, please specify _____

Please rank by numbering the one you use most frequently as 1, etc.

Duration of physical activity you advise.

- a total of 20 minutes/day
- a total of 30 minutes/day
- a total of 40 minutes/day
- Other, please specify _____

Please rank by numbering the one you use most frequently as 1, etc.

Type of physical activity you advise.

- walking
- jogging
- biking/cycling
- swimming
- aerobics class
- active sports, e.g. tennis, skiing, canoeing, frisbee, etc.
- household/lawn and garden/recreational activity
- work or occupational physical activity
- other, please specify _____

Please rank by numbering the one you use most frequently as 1, etc.

Intensity of physical activity you advise.

- 60-85% of maximum heart rate
- 12-13 Rating of Perceived Exertion Scale
- 60-70% maximum METs
- 300 Kilocalorie expenditure/session
- Talk test
- "Moderate" intensity of a brisk walk 3-4 mph
- Other, please specify _____

20. What method(s) do you use to provide physical activity counseling for your clients? Please rank order all apply.

- discuss with patient
- provide written materials/pamphlets
- refer patient to exercise specialist/program
- nothing specific
- other, please specify _____

21. Do you routinely counsel your clients to accumulate 30 minutes of moderate intensity physical activity on most days of the week?

- Yes
- No

22. Do you counsel your clients at least once per year about using physical activity to improve health status?

- Yes
- No

23. Please identify any barriers in your practice that hinder your assessment and counseling of clients about physical activity. Please check all that apply.

- Lack of time during visit
- Not a high priority
- Other concerns are more important
- Language barrier
- Useless, client won't follow through
- No reimbursement for assessing/counseling about physical activity
- Most clients are already physically active
- Neighborhoods unsafe for physical activity
- Other, please specify _____

IV. Physical Fitness Testing

Please choose the best response to each of the following physical fitness measures. The various physical fitness measures are categorized by the type of fitness testing they fall under. If you use a specific physical fitness measure in the office setting, please estimate the percentage of the patients that you use that measure with.

	I am not familiar with this test	I am familiar with this test but do not use it	I use this test in my practice	I use this test with approximately this percent of my patients			
24. Cardiorespiratory Fitness Testing							
a. Rate of Perceived Exertion (RPE) test	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
b. YMCA 3-minute step test	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
c. Rockport 1-mile walk test	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
d. Cycle ergometer test	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
25. Muscular Fitness Testing							
a. Curl-ups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
b. Push-ups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
c. Bench press repetition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
d. Leg press repetition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
26. Flexibility Fitness Testing							
a. Sit and Reach test	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
b. Goniometer use for joint testing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
27. Body Composition Testing							
a. Body Mass Index (BMI)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
b. Waist-to-Hip Ratio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
c. Skinfold measurement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
d. Bioelectrical impedance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
e. Hydrostatic weighing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
28. Balance Testing							
a. Balance Stand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			
b. Balance Walk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<table border="1" style="display: inline-table;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> %			

V. Knowledge and Confidence

29. On a scale of 1 to 5, 1 indicating the least amount of the attribute and 5 indicating the most amount of the attribute, please rate the following:

	Least				Most
Your knowledge about assessing clients for physical activity	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Your knowledge about counseling clients about physical activity	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Your confidence about assessing clients for physical activity	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Your confidence about counseling clients about physical activity	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

V. Educational Preparation

30. Did you receive preparation in the area of physical activity in the educational program that prepared you to be a health practitioner (e.g. nurse practitioner or physician assistant)?

- Yes
 No

30a. If yes, which of the following did you receive preparation about? Please check all that apply.

- The health benefits of physical activity
 The physiology of physical activity
 The type or mode of physical activity to advise
 The intensity of physical activity to advise
 Use of rating of perceived exertion (RPE) to gauge intensity
 Use of maximum heart rate to gauge intensity
 The duration of physical activity to advise
 The frequency of physical activity to advise

31. Have you had any other educational preparation in the area of physical activity prescription?

- Yes
 No

31a. If yes, where did you receive this preparation?

- Baccalaureate nursing program
 Baccalaureate physician assistant program
 Master's Program
 Additional course work
 Conference(s), workshop(s), seminar(s)
 Self-study
 Other, please specify _____

32. Would you be interested in obtaining training related to physical activity counseling? (if no please skip to question #33)

Yes No

32a. What types of training would be of interest to you? (Please rank with 1 indicating the most interesting and 7 the least interesting).

- Online curriculum
- Online curriculum, continuing education credit only
- University courses online
- University courses in person
- Inservice education
- Workshops at professional conference
- Other

33. Do you, yourself, engage in at least moderate physical activity for a total of 30 minutes on most days of the week?

Yes No

34. Check which of the following best describes your current physical activity level. Select only one.

- Inactive.** You have a sit down job and no regular physical activity. You are sedentary.
- Relatively Inactive.** You stand at work three to four hours per day. You have no regular physical activity during leisure time.
- Light Activity.** You are sporadically involved in recreational activities such as weekend golf or light cycling (<3 METS or 4 kcal/min)
- Moderate Activity.** Your job includes physical activity such as lifting or stair climbing, or you participate regularly in recreational or fitness activities such as brisk walking, swimming, or cycling at least 3 days/wk for 30-60 minutes (3-6 METS).
- Vigorous Activity.** You participate in extensive physical activity for 30-60 minutes most days of the week (>6 METS).

THANK YOU for your participation!

APPENDIX B

CHAPTER 5 RECRUITMENT MATERIALS, INFORMATION LETTER,
MODERATORS GUIDE, AND FOCUS GROUP MATERIALS

Subject line: Looking for Physician Assistants for Focus Groups

Hello:

My name is Megan Grimstvedt and I am a doctoral candidate in the Exercise and Wellness Program at ASU. I am recruiting physician assistants to participate in focus groups to get a better understanding of their physical activity counseling practices, confidence to counsel physical activity, the types of information about physical activity that would be most useful to them in practice, and the best way to disseminate this information. I will be conducting focus groups with 5-12 physician assistants per group. Each physician assistant would be asked to participate in only 1 group. Eligibility criteria includes being a licensed physician assistant practicing in a facility where physical activity counseling would be appropriate and applicable. Since participants need to be practicing physician assistants, current students would not be eligible. Refreshments will be served during the focus group and participants will receive a \$15 gift card. I am attaching a flier about the study as well so you can disseminate it to your networks if interested. Thank you in advance for your help. Please contact me at mgrimstv@asu.edu or (480) 297-5303 if you have any questions.

Sincerely,
Megan Grimstvedt, M. A.
Doctoral Candidate and Teaching Associate
Exercise and Wellness Program
College of Nursing and Health Innovation
Arizona State University
7350 East Unity Avenue
Mesa, AZ 85212
Phone: 480 727-1945
Fax: 480 727-1051
E-mail: mgrimstv@asu.edu

Nurse Practitioner Focus Groups



**Are you a Nurse Practitioner?
If so, we need your help!**

- Purpose of the focus groups is to more accurately understand nurses' current physical activity knowledge and counseling behavior and the best methods for disseminating information about physical activity to nurses.
- Participation is open to any practicing nurse practitioner in Arizona working in a facility where physical activity counseling would be appropriate.
- The focus groups will last approximately 90 minutes.
- \$15 gift card for participation!
- If you would like to participate, please email: mgrimstv@asu.edu, with your name, email address and/or phone number, and available days and times for participation.

Nurse Practitioner Focus Group
Megan Grimstvedt
mgrimstv@asu.edu; 480-297-5303

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Physician Assistant Focus Groups



**Are you a Physician Assistant?
If so, we need your help!**

- Purpose of the focus groups is to more accurately understand physician assistants' current physical activity knowledge and counseling behavior and the best methods for disseminating information about physical activity to physician assistants.
- Participation is open to any practicing physician assistants in Arizona working in a field that would allow for physical activity counseling (e.g. family practice, internal medicine).
- The focus groups will last approximately 90 minutes.
- \$15 gift card for participation!
- If you would like to participate please email: mgrimstv@asu.edu, with your name, email address and/or phone number, and available days and times for participation.

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INFORMATION LETTER

Physical Activity Counseling Focus Group Participation for Nurse Practitioners and Physician Assistants

Dear Participant,

I am Megan Grimstvedt, a graduate student under the direction of Assistant Professor Cheryl Der Ananian in the Department Exercise and Wellness at Arizona State University. We are conducting a research study to better understand nurse practitioners' and physician assistants current physical activity knowledge, confidence for physical activity counseling, physical activity counseling behavior, and the best methods for disseminating a physical activity curriculum to these populations.

We are inviting you to participate in a focus group discussion, which will involve approximately an hour and a half of your time. We will be asking you questions about your current physical activity knowledge including how physical activity and fitness pertain to health, where your physical activity knowledge was obtained, your current physical activity counseling behaviors, your perceived strengths and weaknesses in your ability to counsel and the best method of disseminating physical activity information to nurse practitioners and physician assistants.

Your participation in this study is entirely voluntary. For your participation you will receive one \$15 Target gift card. You can refuse to participate or withdraw at anytime without penalty or loss of benefits to which you are otherwise entitled. You have the right not to answer any question, and to stop participation at any time.

Due to the nature of group discussions, confidentiality cannot be guaranteed. However, all participants will be instructed that what was said in the room is to be kept confidential. I would like to audiotape this interview/focus group. You will not be recorded, unless you give permission. If you give permission to be taped, you have the right to ask for the recording to be stopped. Once the audiotapes have been transcribed, the tapes will be destroyed. All transcripts will use a number to identify the focus group participant and only the investigators will know the corresponding ID number. You have the right not to answer any question, and to stop participation at any time. The results of this study may be used in reports, presentations, or publications but your name will not be used.

If you have any questions concerning the research study, please contact the research team: Megan Grimstvedt (mgrimstv@asu.edu) or Dr. Cheryl Der Ananian (cheryld@asu.edu) at (480) 727-1945. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

By signing below you are agreeing to participate to in the study.

Signature

Date

By signing below, you are agreeing to be audio-taped.

Signature

Date

MODERATOR'S GUIDE FOR NURSE PRACTITIONERS AND PHYSICIAN ASSISTANTS REGARDING PHYSICAL ACTIVITY COUNSELING

I. Welcome and Introduction

Moderator introduces self.

Thank you for participating in our focus group discussion today. The purpose of our conversation is to get a better understanding of your current physical activity knowledge, where this knowledge is obtained, your current physical counseling behaviors, strengths and weaknesses in your ability to counsel and the best method of disseminating physical activity information to nurse practitioners and physician assistants.

This project is being conducted by the Department of Exercise and Wellness at Arizona State University.

II. Order of Business

Our discussion will last about an hour and a half.

Please help yourself to the snacks and drinks. We will not be taking a formal break. Please feel free to leave the room if you need to use the restroom.

The restrooms are located -----.

III. Explanation of a focus group

A focus group is a guided discussion. There are no right or wrong answers. We are interested in hearing your point of view even if it's different from what others have said. While your opinions may differ from others we hear today, it's likely that other nurse practitioners and physician assistants will share your point of view, so we would like to hear.

IV. Group guidelines

There are a few guidelines for the group.

a. First, we would like to hear from each of you, but only one at a time. We will be audio-taping the discussion because we don't want to miss any comments. If more than one person speaks at a time, it's hard to understand what is being said once we get back to the office. If you like, when someone is speaking, you can make a note to help you remember a point you would like to make after they finish.

b. Please share all information with us. We are interested in both positive and negative comments.

c. Please be specific when you are discussing topics. Use examples whenever you can.

d. I will be guiding the discussion. I will make every effort to keep the discussion focused. If too much time is being spent on one question, I may move the conversation along so we can cover all the questions.

e. We would like all of you to participate in the discussion. All of your opinions count. Please be respectful of one another and don't judge each other. It's OK to disagree.

f. You do not have to speak directly to me. You may direct your comments to other members of the group.

V. Confidentiality

We will be on a first name basis today, but there will not be any names attached to the comments in the final reports. Your responses will never be associated with your name. We also ask that whatever is discussed here today stays in this room – please do not repeat specific comments that others make today to preserve privacy. Before you speak each time, please say your first name or a nickname. If you don't remember to say your name, I'll say something like, "That was Mary," after you are done.

Are there any questions about the discussion group or anything I've described?

I'd like to begin audio recording this session. Is everyone OK with me doing that?

[If yes, begin audio recording]

Individual introductions

There are name cards in front of each of you. This will help everyone in the group remember each other's names. Let's begin by going around the room and getting to know each other a little bit. Please state your name and what type of work facility or setting you work in. For example, internal medicine, etc.

Now, I'd like to begin our discussion.

1. How has physical activity impacted your health?
 - a. How do you think your physical activity habits influence whether or not you engage in physical activity counseling with your patients?
 - b. How confident are you that you can counsel your patients about physical activity even if you are physically inactive?

2. In what ways does the topic of physical activity come up when you are speaking with your patients?

PROBES:

 - a. Who typically brings up the discussion about physical activity, you or your patients?
 - b. What kinds of questions about physical activity do your patients ask you?
 - c. What kind of questions about physical activity do you ask your patients?
 - d. Have you ever felt like you were unable to answer your patients physical activity questions?
 - i. **PROBE:** What types of questions are you unable to answer? Any others?
REPHRASE: Can you recall any other questions or times?
 - e. What do you do if you cannot answer?
 - i. **PROBE:** Do you find the answer for them? Where? How?
 - f. What would you tell your patients about why exercise is important for health?

3. Do you currently counsel your patients about their physical activity?

PROBES:

 - a. How often do you counsel your patients about their physical activity levels?
 - b. What are the characteristics or types of patients that you are more likely to counsel about physical activity?
 - c. What do you feel your strengths are when it comes to counseling physical activity, if any?
 - d. What do you feel your weaknesses are when it comes to counseling physical activity, if any?

4. How comfortable are you with counseling your patients on physical activity?
 - a. What would help you to be more comfortable counseling your patients?

5. Does your place of employment place any emphasis on counseling patients about physical activity? **REPHRASE:**
 - a. How supportive of physical activity counseling for patients is your current place of employment?
 - b. Has anyone at your current place of employment encouraged you to recommend becoming more physically active to your patients?

PROBES:

 - a. What factors do you think influence this?
 - c. How much time can you reasonably spend counseling patients on physical activity? **REPHRASE:** How much time are you allowed to spend with your patients counseling them about physical activity?

6. Where did you obtain your current knowledge of physical activity? **REPHRASE:** From what sources do you learn about physical activity?
7. Are you familiar with the current physical activity guidelines? **REPHRASE:** Are you familiar with the current physical activity recommendations?
PROBES:
 - a. Can you tell me a little bit about the American College of Sports Medicine and American Heart Association 2007 physical activity guidelines?
 - b. Can you tell me a little bit about the 2008 Surgeon Generals physical activity guidelines?
8. Are you familiar with the American College of Sports Medicine initiative entitled Exercise is Medicine? **REPHRASE:** Have you ever seen or used any of the Exercise is Medicine materials? (Provide examples such as prescription pad, lists for specific conditions, etc.)
 - b. Do you think this would be useful or helpful for you? How so?
 - c. What would you need to know about this program to use it?
 - d. Would you be interested in learning more about it?
9. What information about physical activity would help you to counsel patients on physical activity?
 - a. What would you like to learn about physical activity counseling?
10. What would be the best method of providing you with information about physical activity as it pertains to counseling patients?
PROBES:
 - a. What types of information would be useful for you to learn more about physical activity and/or physical activity counseling? If we were to design a physical activity curriculum for health practitioners, what would you suggest we include to make it useful in practice?
 - b. How interested would you be having a physical activity counseling curriculum available to you?
 - c. What would be the best way for us to deliver a curriculum to you?PROBE: Online, in-person, self-study, etc?
11. Is there anything else about physical activity counseling that would be useful for us to know that I did not address?



HEALTH CARE PROVIDERS' ACTION GUIDE

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HOW TO USE THE GUIDE

The Exercise is Medicine™ Health Care Providers' Action Guide provides physicians and other health care providers with a simple, fast, and effective tool for using physical activity, in the right "dosage", as a highly effective prescription for the prevention, treatment, and management of more than 40 of the most common chronic health conditions encountered in primary practice.

This guide acknowledges and respects that today's modern health care provider has very little time for exercise-counseling (probably no more than 20-30 seconds) during the normal office visit and empowers you to:

1. Either write an exercise prescription, depending on the health, fitness level, and physical activity preferences of your patient, or
2. Refer your patient to a certified health and fitness professional, who specializes in exercises counseling and who will oversee your patient's exercise under your supervision.

Here's how to get started:

1. Review *How to Use the Guide*, which you are currently reading. Once you have read this, it is highly recommended that you read through the *Exercise Prescription and Referral Process* document. This is the core of the guide and will explain how to either quickly write a prescription for your patient or else refer them to a certified health and fitness professional.
2. Once you are comfortable with the prescription and referral process, use the [Exercise and Readiness Prescription Pad](#) to either give your patient a physical activity prescription or to refer them to a health and fitness professional.
3. If your patient is healthy, print out and give them a [Starting an Exercise Program Patient Handout](#).
4. If your patient has a chronic health condition, look at the [Your Prescription for Health series](#) to see if your patient's condition is included in this series and, if it is, print out and give them the appropriate patient handout on how to safely exercise with their condition. This series has been reviewed by experts from the American College of Sports Medicine.

Print out and display copies of the [Physician Office Flyer](#) in your waiting room and any other locations you deem appropriate.



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PRESCRIPTION & REFERRAL PROCESS

Dear Health Care Provider,

One of most important decisions your patients will make regarding their overall health is to incorporate physical activity into their lifestyle. Your encouragement may be the greatest influence on this decision.

The algorithm given below will give you guidance in monitoring your patients and helping them to exercise. It's a simple and quick, but effective, three-step process: first, you'll find out about each patient's current physical activity level; then, you'll determine if your patient is healthy enough for independent exercise; and finally, if your patient exercises less than the recommended level (as most patients do), you'll see how to quickly use the simplified Stages of Change model described below to best help your patient.

Some patients will be ready only for encouragement, some will be prepared to read the Starting an Exercise Program patient handout in this guide; and some will be willing to get an exercise prescription from you or a certified health fitness professional that you'll refer them to as part of the Exercise is Medicine program. After you've read through the description below, you'll find a template exercise prescription form (see the *Exercise Prescription and Referral Form* on page 5) for use to copy and use with your patients.

1. Ask patient if they currently exercise? (See recommended guidelines¹)

If YES,

Type/s of Activity _____ How Hard? _____

How Long? _____ How Often? _____

Then go to Step 2.

If NO, ask why not, and determine if the patient is willing to start a lifestyle modification program/exercise program?

If YES, go to step 2.

If NO, briefly discuss benefits of exercise with patient, provide educational handout discussing such, and encourage patient to start adding extra activity/steps to their day, as well as improving dietary choices, if need be. Schedule a nurse or other allied health care professional to follow-up with patient in one week to see if patient is interested in starting lifestyle modification program/exercise program. If YES, at follow-up, go to step 2.

2. Determine if patient is healthy enough to exercise independently, and determine the appropriate actions necessary for exercise counseling and/or referral to a fitness professional.

Administer Physical Activity Readiness Questionnaire (see Appendix A): The Physical Activity Readiness Questionnaire (PAR-Q), a screening/educational tool, focuses on symptoms of heart disease while identifying musculoskeletal problems that should be evaluated prior to participation in an exercise program.

If your patient answered NO to all of the PAR-Q questions, he or she may be cleared for independent physical activity. If you clear your patient for independent physical activity, you can write an exercise prescription based on the [2008 Physical Activity Guidelines for Americans¹](#). Alternatively, you may refer your patient to a fitness professional for personalized exercise counseling. Apparently healthy patients who you clear for independent exercise will still benefit from exercise counseling. In this case, you may refer your patient to a non-clinical fitness professional² such as a certified personal trainer or a health fitness specialist.

If your patient answered YES to any of the PAR-Q questions, he or she may still be cleared for independent or monitored physical activity. Use your professional judgment when deciding whether a patient with a clinical condition can be cleared to exercise independently or whether they need to exercise under the supervision of a clinical exercise professional². If you clear your patient for independent physical activity, you can write an exercise prescription based on the [2008 Physical Activity Guidelines for Americans¹](#), or you can refer your patient to a fitness professional for exercise counseling. Patients with a clinical condition who you clear for independent activity, just like apparently healthy patients, will still benefit from exercise support and can be referred to a non-clinical fitness professional² who is trained to work with such individuals (for example, ACSM's Health Fitness Specialist) or to a certified personal trainer. Higher-risk patients with a disease who need supervised exercise should be referred to a clinical exercise professional² such as [ACSM's Registered Clinical Exercise Physiologist or Clinical Exercise Specialist](#).

3. Determine which stage of change (precontemplation, contemplation, preparation, or action and maintenance) patient is in, and take appropriate action, as indicated in the chart below.

Stage of Change	Action	
Precontemplation (Patient not ready to exercise)	Encourage patient to consider exercising; tell patient about health benefits of exercise.	
Contemplation (If patient interested in or thinking about exercising)	<i>Independent</i> Write prescription; refer to non-clinical fitness professional ^{2,3}	<i>Supervision Necessary</i> Refer to clinical exercise professional ^{2,3}
Preparation (If patient exercising less than recommended amount ¹)	Write prescription; refer to non-clinical fitness professional ^{2,3}	Refer to clinical exercise professional ^{2,3}
Action and Maintenance (If patient is exercising recommended amount ¹)	Encourage continued exercise	Encourage continued supervised exercise

4. Use the Exercise Prescription and Referral Form (see page 5/Appendix B) to write an exercise prescription and/or referral, based the action determined from the chart in step 3. If a referral is needed, the Physical Activity Clearance Form (see Appendix C) may be filled out and given to the patient's fitness or exercise professional.

For more information, visit www.exerciseismedicine.org.

¹Minimum of 150 minutes of moderate physical activity a week (for example, 30 minutes per day, five days a week) and muscle-strengthening activities on two or more days a week ([2008 Physical Activity Guidelines for Americans](#)). Moderate physical activity means working hard enough to raise your heart rate and break a sweat, yet still being able to carry on a conversation. Examples: brisk walking, ballroom dancing or general gardening.

²It is highly recommended that you refer your patients only to fitness professionals who have been certified through an NCCA-accredited association (click on "Accredited Certification Programs" at www.ncca.org) such as the American Council on Exercise (ACE), the American College of Sports Medicine (ACSM), the Cooper Clinic, the National Academy of Sports Medicine (NASM), the National Strength and Conditioning Association (NSCA), or one of the seven other accredited fitness associations (Academy of Applied Personal Training Education, International Fitness Professionals Association, National Athletic Trainers' Association Board of Certification, National Council on Strength and Fitness, National Exercise and Sports Trainers Association, National Exercise Trainers Association, National Federation of Professional Trainers).

³The American College of Sports Medicine is currently developing a referral process to exercise professionals.



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EXERCISE PRESCRIPTION & REFERRAL FORM

This document is available for download in PDF format at www.exerciseismedicine.org/physicians.htm.

Use the Exercise Prescription and Referral Form to write an exercise prescription and/or referral, based on the action determined from the Prescription & Referral Process. If a referral is needed, the Physical Activity Clearance Form (see Appendix C) may be filled out and given to the patient's fitness or exercise professional.

EXERCISE PRESCRIPTION & REFERRAL FORM

PATIENT'S NAME: _____

HEALTH CARE PROVIDER'S NAME: _____

DOB: _____

SIGNATURE: _____

DATE: _____

PHYSICAL ACTIVITY RECOMMENDATIONS

Type of physical activity:	Aerobic	Strength
Number of days per week:		
Minutes per day:		
Total minutes per week*:		

*PHYSICAL ACTIVITY GUIDELINES
 Adults aged 18-64 with no chronic conditions: Minimum of 150 minutes of moderate physical activity a week (for example, 30 minutes per day five days a week) and muscle-strengthening activities on two or more days a week. (2008 Physical Activity Guidelines for Americans)
 For more information, visit www.govt.gov/physicalactivity

REFERRAL TO HEALTH & FITNESS PROFESSIONAL

Name: _____

Phone: _____

Address: _____

Web Site: _____

Follow-up Appointment Date: _____

Notes: _____



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STARTING AN EXERCISE PROGRAM

This handout is available for download at www.exerciseismedicine.org/physicians.htm

Starting an exercise program can sound like a daunting task, but just remember that your main goal is to boost your health by meeting the basic physical activity recommendations: 30 minutes of moderate-intensity physical activity at least five days per week or vigorous-intensity activity at least three days per week, and strength training at least twice per week.

Guidelines for healthy adults under age 65 with no apparent chronic disease or condition

STEP 1 - Set aside time each day to exercise. Getting started can often be the most difficult part of any exercise routine. Scheduling exercise into your day and making it a priority will increase the chance of being successful.

STEP 2 - Choose cardiovascular activities you enjoy, such as swimming, biking, or playing basketball with friends to get your daily physical activity. If you need a variety of activities to stay motivated, combine a few that appeal to you. Physical activity can be accumulated through a variety of activities, not just running. **Walking** is a great way to do moderate-intensity physical activity. Moderate-intensity physical activity means working hard enough to raise your heart rate and break a sweat, yet still being able to carry on a conversation.

STEP 3 - Start with 10 to 15 minutes of cardiovascular exercise daily. Each week, add five minutes to your exercise routine until you reach 30 minutes of moderate-intensity for a minimum of five days per week. Alternately, you may do 20 minutes of vigorous-intensity exercise three days per week. The 30-minute recommendation is for the average healthy adult to maintain health and reduce the risk for chronic disease. It should be noted that to lose weight or maintain weight loss, 60 to 90 minutes of physical activity may be necessary.

STEP 4 Incorporate strength training into your routine. Do eight to 10 strength training exercises, eight to 12 repetitions of each exercise twice a week. This can be accomplished by using dumbbells, resistance bands or your own body weight. If you are unsure how to perform the exercises correctly, seek the advice of an exercise professional.



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YOUR PRESCRIPTION FOR HEALTH SERIES

Information and recommendations for exercising safely with a variety of health conditions.

This series is available for download at

www.exerciseismedicine.org/YourPrescription.htm

The image shows two overlapping sample pages from the 'Your Prescription for Health Series'. The top page is titled 'EXERCISING WITH ARTHRITIS' and the bottom page is titled 'EXERCISING WITH TYPE 2 DIABETES'. Both pages feature the 'Exercise is Medicine' logo and provide detailed information on getting started, exercise cautions, and contact information. The pages are designed as handouts for health care providers to use with their patients.



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OFFICE FLIER

This flier is available for download at www.exerciseismedicine.org/physicians.htm in high resolution (for printing) and low resolution (for e-mail attachments and online viewing).



PHYSICAL ACTIVITY READINESS QUESTIONNAIRE



PATIENT'S NAME: _____

DOB: _____

DATE: _____

HEALTH CARE PROVIDER'S NAME: _____

Please read the questions below carefully, and answer each one honestly. Please check YES or NO.

- Yes No Has your health care provider ever said that you have a heart condition and that you should only do physical activity recommended by a health care provider?
- Yes No Do you feel pain in your chest when you do physical activity?
- Yes No In the past month, have you had chest pain when you were not doing physical activity?
- Yes No Do you lose your balance because of dizziness or do you ever lose consciousness?
- Yes No Do you have a bone or joint problem (for example, back, knee or hip) that could be made worse by a change in your physical activity?
- Yes No Is your health care provider currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?
- Yes No Do you know of any other reason why you should not do physical activity?

Excerpted from the Physical Activity Readiness Questionnaire (PAR-Q) © 2002. Used with permission from the Canadian Society for Exercise Physiology

PHYSICAL ACTIVITY READINESS QUESTIONNAIRE



PATIENT'S NAME: _____ DOB: _____ DATE: _____

HEALTH CARE PROVIDER'S NAME: _____

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- Yes No Is your health care provider currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?
- Yes No Do you know of any other reason why you should not do physical activity?

Excerpted from the Physical Activity Readiness Questionnaire (PAR-Q) © 2002. Used with permission from the Canadian Society for Exercise Physiology

EXERCISE PRESCRIPTION & REFERRAL FORM



PATIENT'S NAME _____ DOB: _____ DATE: _____
 HEALTH CARE PROVIDER'S NAME: _____ SIGNATURE: _____

PHYSICAL ACTIVITY RECOMMENDATIONS

Type of physical activity:	Aerobic	Strength
Number of days per week:		
Minutes per day:		
Total minutes per week*:		

***PHYSICAL ACTIVITY GUIDELINES**

Adults aged 18-64 with no chronic conditions: Minimum of 150 minutes of moderate physical activity a week (for example, 30 minutes per day, five days a week) and muscle-strengthening activities on two or more days a week ([2008 Physical Activity Guidelines for Americans](http://www.acsm.org/physicalactivity))
 For more information, visit www.acsm.org/physicalactivity.

REFERRAL TO HEALTH & FITNESS PROFESSIONAL

Name: _____
 Phone: _____
 Address: _____

 Web Site: _____
 Follow-up Appointment Date: _____
 Notes: _____

EXERCISE PRESCRIPTION & REFERRAL FORM



PATIENT'S NAME _____ DOB: _____ DATE: _____
 HEALTH CARE PROVIDER'S NAME: _____ SIGNATURE: _____

PHYSICAL ACTIVITY RECOMMENDATIONS

Type of physical activity:	Aerobic	Strength
Number of days per week:		
Minutes per day:		
Total minutes per week*:		

***PHYSICAL ACTIVITY GUIDELINES**

Adults aged 18-64 with no chronic conditions: Minimum of 150 minutes of moderate physical activity a week (for example, 30 minutes per day, five days a week) and muscle-strengthening activities on two or more days a week ([2008 Physical Activity Guidelines for Americans](http://www.acsm.org/physicalactivity))
 For more information, visit www.acsm.org/physicalactivity.

REFERRAL TO HEALTH & FITNESS PROFESSIONAL

Name: _____
 Phone: _____
 Address: _____

 Web Site: _____
 Follow-up Appointment Date: _____
 Notes: _____



Physical Activity Clearance Form

Clearance requested for: _____

Health care provider's name: _____

Please sign the statement that reflects your wishes:

1. This patient may engage in an exercise program **only under clinical supervision.**
2. This patient may engage in an exercise program **only under the supervision of a community-based health club professional.**
3. This patient may engage in **independent (unrestricted) moderate intensity exercise.**

Restrictions: _____

Return form to: _____

Health care provider's signature: _____ Date: _____



Physical Activity Clearance Form

Clearance requested for: _____

Health care provider's name: _____

Please sign the statement that reflects your wishes:

1. This patient may engage in an exercise program **only under clinical supervision.**
2. This patient may engage in an exercise program **only under the supervision of a community-based health club professional.**
3. This patient may engage in **independent (unrestricted) moderate intensity exercise.**

Restrictions: _____

Return form to: _____

Health care provider's signature: _____ Date: _____

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