

6-2-2021

Move More, Sit Less: Applying the Physical Activity Guidelines for Americans to Extension Programs

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Recommended Citation

Balis, L. E., Fuerniss, H. F., Brown, D. T., Marshall, C., & Harden, S. M. (2021). Move More, Sit Less: Applying the Physical Activity Guidelines for Americans to Extension Programs. *Journal of Human Sciences and Extension*, 9(2), 11. <https://scholarsjunction.msstate.edu/jhse/vol9/iss2/11>

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Extension enhances the lives of Americans by translating research-based information related to existing needs into programming that is practical and accessible to the general public. Evidence clearly indicates that physical activity is correlated to positive health outcomes, but despite this conclusion, the majority of Americans do not meet the recommendations for physical activity. The 2nd Edition of the Physical Activity Guidelines for Americans provides guidance for Extension professionals to implement physical activity interventions. We recommend training and technical assistance strategies based on the Interactive Systems Framework to integrate physical activity promotion into all Extension areas.

Keywords: physical activity, exercise, chronic disease, health

Introduction

The national Cooperative Extension System was originally formed to bring research and education to those involved in the agricultural community (U.S. Department of Agriculture, n.d.). Just as Extension agents/educators (herein: agents) advanced agricultural practices for the last century, Extension professionals can improve the health behaviors of Americans today. A shift in community needs is evidenced by the rising prevalence of chronic disease due, in part, to modifiable health behaviors. In fact, the severity of our nation's health is illustrated by the fact that 50% of adults suffer from at least one chronic condition (Ward et al., 2014). The prevalence of these conditions is also increasing in children; therefore, the need for multilevel intervention

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across the lifespan is indisputable. One modifiable health behavior is physical activity (Durstine et al., 2013; Warburton et al., 2006). Overwhelming evidence has linked insufficient physical activity to negative health outcomes in the United States (Physical Activity Guidelines Advisory Committee, 2018; Warburton et al., 2006).

With a presence in most counties in the United States, Extension is positioned to interact with and provide practical health solutions to local communities. The term “physical activity” was added to the Agricultural Act (Farm Bill) of 2014, formally authorizing the promotion of physical activity in state programming (U.S. Department of Agriculture, 2015). Although some Extension professionals had previously incorporated physical activity components into their programming, this addition provided further motive for integrating physical activity promotion into Extension programming to promote overall health (Harden et al., 2018; U.S. Department of Agriculture, 2015).

Many Extension professionals and volunteers offer physical activity-focused programming (Harden et al., 2020). These strategies include direct education such as the learner-centered Eating Smart-Being Active (Auld et al., 2015), online walking and fruit/vegetable consumption challenges (Harden et al., 2019), and environmental change such as Complete Streets policies (Holston et al., 2020). However, challenges remain. Extension professionals have expressed hesitancy about incorporating physical activity promotion into their roles and responsibilities (Balis et al., 2018; Peña-Purcell et al., 2012). Agents face barriers, including a lack of confidence, a perception that physical activity recommendations are hard to meet, a lack of training, unfamiliarity with evidence-based physical activity programs, and concerns over liability (Balis et al., 2018; Peña-Purcell et al., 2012).

These barriers may be alleviated by using evidence-based recommendations (research) to inform and deliver evidence-based programming (practice). The Physical Activity Guidelines for Americans, 2nd Edition (herein: Guidelines; U.S. Department of Health and Human Services, 2018) is one such source; structuring program planning around helping participants meet recommendations can ensure that Extension professionals implement physical activity programs that are evidence-based and help participants increase physical activity levels to decrease the risk of chronic disease. While the Guidelines provide a starting point for understanding types and amounts of physical activity to recommend, dissemination and implementation do not happen on their own (Brownson & Jones, 2009). That is, the availability of the Guidelines does not mean practitioners will know of their availability (dissemination) and integrate them into their work (implementation) without specific efforts. Borrowing from dissemination and implementation science, we recommend training and technical assistance as implementation strategies (i.e., methods of improving the uptake and delivery of evidence-based programs; Proctor et al., 2013) to speed the translation of research to practice (Powell et al., 2015).

The purpose of this commentary is to 1) provide an overview of the updated Physical Activity Guidelines for Americans and its relevance for Extension, 2) apply a framework for moving the Guidelines into practice, and 3) suggest how this work could be inclusive of all Extension focus areas to make a system-wide shift. This information is intended to be used by those supporting program delivery (e.g., specialists and program leaders) or delivering programs (e.g., educators or agents).

Physical Activity Guidelines for Americans, 2nd Edition

In 2018, the Physical Activity Guidelines Advisory Committee published a scientific report after extensively reviewing relevant literature and summarizing key information related to physical activity, sedentary behavior, and health. Informed by this report, the government released the 2nd Edition of the Guidelines. While the Guidelines may be used by the public to make healthful changes on an individual and family level, the intended audience is policymakers and health professionals – such as Extension practitioners – who have the opportunity to influence health behaviors on a larger scale (U.S. Department of Health and Human Services, 2018). Additionally, through the Move Your Way Campaign, resources and consumer-facing messages are provided (U.S. Department of Health and Human Services, 2020), making it accessible and convenient for Extension educators to include the messaging into their current programming or to adopt new initiatives focused solely on reducing sedentary behavior and being active.

Using the Guidelines as an evidence-based strategy for planning Extension programs can help Extension professionals understand how much and what types of physical activity should be promoted. With the overall goal of preventing chronic disease, the 2018 Guidelines include aerobic activity and muscle-strengthening activities for all age groups as well as bone-strengthening activities for youth and balance activities for older adults (U.S. Department of Health and Human Services, 2018). The recommendations for each age group are:

- Preschool-aged children (age 3-5): be physically active throughout the day. Active play should include a variety of activity types.
- Youth (6-17): engage in 60 minutes of moderate to vigorous intensity per day. This should include vigorous intensity physical activity, muscle strengthening activities, and bone-strengthening activities at least three days per week each.
- Adults (18-64): engage in 150 to 300 minutes of moderate intensity or 75 to 150 minutes of vigorous intensity aerobic physical activity each week, as well as incorporating muscle-strengthening activities on two or more days per week
- Older adults (65 and older): the recommendations are the same as for adults, with the addition of balance training. Those with chronic conditions should be as active as their abilities and conditions allow.

While the first edition of the Guidelines stated that activity needed to be performed in increments of at least 10 minutes, recent evidence suggests that any duration of physical activity can be included in the weekly total (U.S. Department of Health and Human Services, 2018). The 2018 Guidelines recommend physical activity bouts of any length – for example, climbing a few flights of stairs – to reap health benefits. This is reinforced through key messages of moving more and sitting less, starting with five minutes of activity per week if time is tight, and counting any type of physical activity that gets you moving (including raking, vacuuming, gardening, playing catch, and dancing).

The new Guidelines also include the risks of sedentary behavior (i.e., sitting, reclining, or lying). While the Guidelines do not recommend a specific target amount of sedentary time, they clarify that higher levels of sedentary time are associated with risk of disease and recommend reducing sedentary time in addition to increasing moderate-to-vigorous activity. Essentially, the Guidelines emphasize that a sedentary lifestyle is more harmful than the potential unintended negative side effects (sore muscles, tripping) of being physically active.

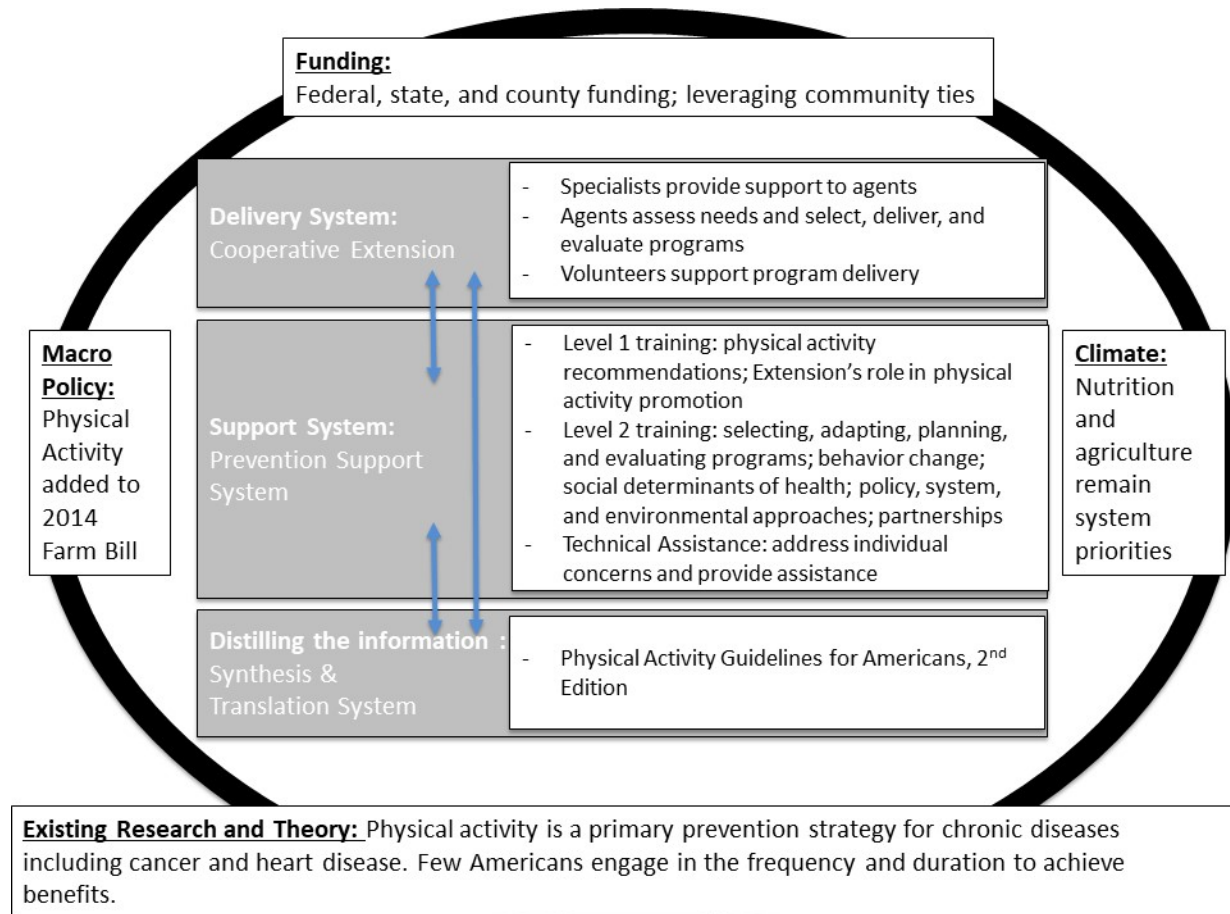
Finally, the 2nd edition of the Guidelines includes a section on using evidence-based strategies to increase physical activity levels. The evidence-based strategies listed in the Guidelines include theory-based approaches to change physical activity behaviors at individual or interpersonal levels and environmental changes at the community level. At the individual and interpersonal levels, these behavioral strategies include goal setting, monitoring progress, social support, self-reward, positive self-talk, structured problem solving, buddy systems, and contracts (U.S. Department of Health and Human Services, 2018). The recommended community strategies include point-of-decision prompts, school policies and practices, access to recreation facilities or outlets, community-wide campaigns, and community designs. Overall, the Guidelines in and of themselves could be seen as a dissemination strategy (i.e., a targeted approach to spreading information; Rabin et al., 2008) for these strategies and programs; however, Extension professionals (whose background is more often in food or family development) would benefit from capacity building around what the Guidelines are and how to implement them.

A Framework for Integrating the Physical Activity Guidelines for Americans into Extension

To accomplish the goal of integrating the Guidelines into Extension programming, a capacity-building model can be applied. There are over 100 dissemination and implementation models (Tabak et al., 2012) from which to choose to guide this work. One model relevant to this work is the Interactive Systems Framework (ISF) (Wandersman et al., 2008), which was the first to put capacity building as the centerpiece of the translation and implementation process (Noonan et al., 2012). Within the ISF, there are three systems. The first system translates underlying evidence-based features into formats for the end-user (e.g., staff, volunteers, stakeholders). The second system works to provide training, technical assistance, and other identified support needs to users

in the field. The third system is the delivery personnel who support and implement the innovation in real-world settings (see Figure 1 for Interactive Systems Framework concepts applied to physical activity promotion in Extension).

Figure 1. Using the Interactive Systems Framework to Disseminate and Implement Physical Activity Guidelines for Americans in Extension (Wandersman et al., 2008)



With the Guidelines serving as the synthesis and translation system (i.e., they distill the information through synthesizing the evidence), we recommend training and technical assistance as a prevention support system to build capacity in the delivery system. Training, technical assistance, and ongoing support are recognized as implementation strategies necessary to ensure intervention uptake, fidelity, and sustainability (Beidas et al., 2012; Edmunds et al., 2014; Powell et al., 2015). We recommend two levels of capacity building for Extension personnel: one level for all personnel who deliver programs in any field (e.g., community development, agriculture), and a second level for those who can deliver dedicated physical activity programs within the scope of their responsibilities (e.g., family and consumer science, 4-H).

Training should be designed to address identified barriers to delivering physical activity programs (lack of confidence, perceptions of recommendation, lack of familiarity with evidence-based programs, and liability concerns (Balis et al., 2019; Peña-Purcell et al., 2012) through focusing on the Guidelines and using best evidence on training physical activity delivery personnel. While the literature on training community-based personnel to deliver physical activity programs is limited (Ramalingam et al., 2019), evidence-based training in Physical Activity in Public Health (PAPH) exists (Dallman et al., 2009) that could be adapted for the Extension setting to increase PAPH competencies and guide practitioners to implement evidence-based physical activity interventions.

The first level of training should include types (e.g., aerobic activity vs. strength training), durations (e.g., one hour per day for youth), and intensity levels (e.g., how to identify light vs. moderate intensity activity) of recommended physical activity by age group based on the Guidelines and Extension's role in physical activity promotion. For example, training would explain why strength training should be included in physical activity promotion or clarify that stretching is not part of the Guidelines. As for Extension's role in physical activity promotion, training can clarify that Extension practitioners are not expected to serve as personal trainers or fitness instructors and address safety and liability concerns. For example, risks can be reduced by gradually increasing physical activity over time, replacing sedentary time with light intensity physical activity when working with inactive participants, and using screeners such as the PAR-Q to have participants self-assess readiness for physical activity (Thompson et al., 2013).

Following this introductory module, the second level of training should include selecting and adapting evidence-based programs, behavior change strategies, social determinants of health, policy, system, and environmental (PSE) approaches, partnerships for physical activity promotion, and planning/evaluating physical activity programming. For example, the selecting and adapting evidence-based program module could include the evidence-based programs in the Guidelines as well as other repositories such as the SNAP-Ed Toolkit (U.S. Department of Agriculture, 2019), the Community Guide (Community Preventive Services Task Force, n.d.), and Research-Tested Intervention Programs (National Cancer Institute and Substance Abuse and Mental Health Services Administration, n.d.). Finally, this training should be followed with proactive technical assistance, as training alone is often insufficient to bring about behavior change (Wandersman et al., 2008). Technical assistance is designed to address individual concerns and provide assistance to learn how to deliver new programs.

Integrating Physical Activity Programming in all Extension Areas

Physical activity promotion can be integrated across all programming areas of Extension at various doses (e.g., short activity breaks to multisession interventions). Extension professionals can use the updated Guidelines to guide their work through promoting physical activity behaviors at levels to achieve health benefits (U.S. Department of Health and Human Services,

2018). In particular, the 2nd edition of the Guidelines can be used to promote 1) reducing sedentary time throughout Extension programming, 2) accumulating physical activity through less than 10-minute bouts, and 3) using evidence-based strategies to guide programming. See Table 1 for practical implementation suggestions across each Extension program area.

Reducing Sedentary Time

As described in the Guidelines, reducing sedentary time is a distinct strategy for improving health (U.S. Department of Health and Human Services, 2018). Anecdotal evidence suggests that Extension programming often entails long periods of sitting during instruction of participants. One project assessed the degree to which 4-H summer campers were active through a validated observational protocol that included scanning a designated area and determining if people within the area were sedentary, moderately active, or vigorously active (Everette & Harden, 2015). Researchers conducted 925 observations across 12 days of camp (34% of total days) and found that the participants were sedentary for 66% of the observations, moderate for 16%, and vigorous for 18%. This highlights a need and opportunity to promote less sedentary time in Extension programming. For example, Extension professionals in all disciplines can provide opportunities to stand or walk throughout meetings, instruction, and events. See Table 1 for suggestions.

Including Physical Activity in Less Than 10 Minute Bouts

Incorporating even short bouts (e.g., five minutes) of physical activity in Extension programs can help participants decrease sitting time and work towards meeting Guidelines. Replacing class instruction time with physical activity – even 15-20 minutes – has been shown to have no negative impacts on the original program's outcomes (Palmer-Keenan et al., 2014).

Extension professionals can also facilitate short bouts of lifestyle physical activity through implementing environmental changes in addition to direct education. This aligns with the update in the recent version of the Guidelines that any amount of physical activity can now count toward the weekly total. For example, climbing a few flights of stairs, walking briskly from the car to the store, or doing 20 jumping jacks upon standing up from a desk all count. PSE efforts change the environment, whether by physical means or via policy or systems interventions, and can facilitate these brief bouts of physical activity. Additionally, changing the environment has a greater impact on health and requires less individual effort than direct education (Frieden, 2010). With the release of the Healthy, Hunger-Free Kids Act in 2010 (U.S. Department of Agriculture, 2010) and the Cooperative Extension's National Framework for Health and Wellness in 2014 (Braun et al., 2014), PSE efforts could be supported by Extension. These efforts have also been emphasized through specific funding opportunities (Centers for Disease Control and Prevention, 2019).

Adopt Evidence-Based Physical Activity Programs

Evidence-based programs have been tested through research for effectiveness, with those findings published in a peer-reviewed journal (National Cancer Institute and Substance Abuse and Mental Health Services Administration, n.d.). As Extension has struggled to implement physical activity programs that are evidence-based (Balis et al., 2019; Strayer et al., 2020), the section on evidence-based strategies provides a helpful starting point for Extension professionals to select evidence-based programs. Reviews of Extension physical activity programs show that evidence-based behavioral strategies are seldom used (Balis et al., 2019; Harden et al., 2019). Extension practitioners could benefit from applying the strategies listed in the Guidelines, as using tested behavioral strategies can lead to long-lasting change in physical activity behaviors (Greaves et al., 2010; Heath et al., 2012; Horodyska et al., 2015). By incorporating these strategies, Extension professionals can move beyond teaching physical activity classes (which may not result in changes beyond the end of the class) and expand their reach by delivering programs with behavior change strategies to new groups of participants.

Table 1. Examples of Integrating Physical Activity Promotion across Extension

Program Area	Reduce Sedentary Time	Include PA in Less Than 10-minute Bouts	Adopt Evidence-based Physical Activity Programs
All Extension program areas	<ol style="list-style-type: none"> 1. Standing applause activity breaks 2. Active ice breakers 3. Strategic set up of the room (equipment on one side of the room and food on the other) 	Lead participants through brief, easy-to-learn exercise routines (Auld et al., 2015)	<ol style="list-style-type: none"> 1. Discuss programming need with your specialist and other community stakeholders 2. Identify and adapt programs from evidence-based program repositories (Harden et al., 2020) 3. Advertise evidence-based effects of participation on physical activity levels
Family and Consumer Sciences (FCS)	Place refreshments at gatherings and events further from meeting rooms to encourage a few minutes of physical activity	Implement physical activity PSEs including crosswalks and pedestrian lanes to enhance walkability (Spear et al., n.d.), point of decision prompts to increase stairway use (Balis & Strayer, 2019)	Adopt programs targeting both nutrition and physical activity behaviors, e.g., online tracking challenges (Harden et al., 2019), in-person older adult programs (Balis et al., 2018; Wilson et al., 2018a; 2018b)
Federal nutrition education programs (SNAP-Ed and EFNEP)	Ask people to physically engage in a question-and-answer: “Has anyone tried to cut a cylindrical vegetable, like a carrot, and had it roll on the	Include a 10-minute walk at the beginning of nutrition classes	Follow federal mandates and adopt programs that include physical activity experiences: <ol style="list-style-type: none"> 1. Eating smart, being active (Auld et al., 2015)

Program Area	Reduce Sedentary Time	Include PA in Less Than 10-minute Bouts	Adopt Evidence-based Physical Activity Programs
	countertop? Stand up if you have! See, you're not alone; most of us have had a carrot roll a time or two. You can sit back down. Guess what? You just got a free squat!"		2. Physical Activity interventions listed in the SNAP-Ed Toolkit (U.S. Department of Agriculture, 2019)
4-H	Incorporate physical activity into project workshops (i.e., walk around a park while practicing photography, do bodyweight exercises correlated to the number of minutes a recipe must cook)	Plan meeting activities that revolve around favorite forms of physical activity (e.g., tag, swimming, yard games, sports) rather than sedentary activities	Implement a 4-H healthy meeting challenge including 15 minutes of physical activity (Balis & Harden, 2019; Economos et al., 2019; Folta et al., 2015)
Agriculture	<ol style="list-style-type: none"> 1. Demonstrate how to break up sedentary time (e.g., while operating a tractor) 2. Discuss exercises that will decrease chances of injury while lifting, bending, shoveling, and doing everyday work on the farm or ranch 3. Intentionally include a walking portion of crop/ranchland tours or field days 	Encourage participants to try the exercises during classes and afterward, and help them understand the benefits of increasing physical activity in their daily lives	Work with your specialist to search evidence-based program repositories and adapt programs for agricultural producer audiences
Horticulture (e.g., Master Gardeners)	<ol style="list-style-type: none"> 1. Place program supplies throughout the room (e.g., scissors and paper supplies on one table and soil and seeds on another) 2. Lead participants through a demonstration first and then encourage physical participation whenever able (e.g., trimming trees, controlling weeds/pests, planning a garden) 3. Incorporate PA into all classes and Master Gardener sessions throughout the entire training course 	<ol style="list-style-type: none"> 1. Incorporate a session into the Master Gardener curriculum that covers the physical activity aspects and benefits of gardening (e.g., PA levels of tending of ground-level garden beds vs. elevated raised garden beds) 2. Target safe PA education towards the elderly gardening demographic that can be implemented during their daily care of the garden 	Leverage Master Gardeners to implement a mentored gardening intervention addressing nutrition and physical activity, such as Harvest for Health (Blair et al., 2013; Winkels et al., 2020)

Conclusion

Engaging in regular physical activity is an effective strategy in preventing chronic conditions, including cardiovascular disease, stroke, and type 2 diabetes. The 2nd Edition of the Guidelines can support Extension professionals to promote reducing sedentary time throughout Extension programming, accumulating physical activity through less than 10-minute bouts, and using evidence-based strategies to conduct programming. Each of these methods can be used across Extension disciplines to integrate physical activity promotion throughout the system. Finally, using the Interactive Systems Framework as a model, training and technical assistance are recommended implementation strategies to build confidence and capacity.

References

- Auld, G., Baker, S., Conway, L., Dollahite, J., Lambea, M., & McGirr, K. (2015). Outcome effectiveness of the widely adopted EFNEP curriculum Eating Smart-Being Active. *Journal of Nutrition Education and Behavior*, *47*(1), 19–27. <http://doi.org/10.1016/j.jneb.2014.07.001>
- Balis, L. E., & Harden, S. M. (2019). Scaling out a 4-H healthy meeting initiative: Challenges in implementation and comprehensive evaluation. *Journal of Nutrition Education and Behavior*, *51*(8), 1020–1024. <http://doi.org/10.1016/j.jneb.2019.05.288>
- Balis, L. E., & Strayer, T., III. (2019). Evaluating “Take the Stairs, Wyoming!” through the RE-AIM framework: Challenges and opportunities. *Frontiers of Public Health*, *7*, Article 368. <http://doi.org/10.3389/fpubh.2019.00368>
- Balis, L. E., Strayer, T., III, Ramalingam, N., & Harden, S. M. (2018). Beginning with the end in mind: Contextual considerations for scaling-out a community-based intervention. *Frontiers in Public Health*, *6*, Article 357. <http://doi.org/10.3389/fpubh.2018.00357>
- Balis, L. E., Strayer, T., III, Ramalingam, N., Wilson, M., & Harden, S. M. (2018). Open-access physical activity programs for older adults: A pragmatic and systematic review. *The Gerontologist*, *59*(4), e268–e278. <https://doi.org/10.1093/geront/gnx195>
- Beidas, R., Edmunds, J., Marcus, S., & Kendall, P. (2012). Training and consultation to promote implementation of an empirically supported treatment: A randomized trial. *Psychiatric Services*, *63*(7), 660–665. <http://doi.org/10.1176/appi.ps.201100401>
- Blair, C. K., Madan-Swain, A., Locher, J. L., Desmond, R. A., de Los Santos, J., Affuso, O., Glover, T., Smith, K., Carley, J., Lipsitz, M., Sharma, A., Krontiras, H., Cantor, A., & Demark-Wahnefried, W. (2013). Harvest for Health gardening intervention feasibility study in cancer survivors. *Acta Oncologica*, *52*(6), 1110–1118. <http://doi.org/10.3109/0284186X.2013.770165>
- Braun, B., Bruns, K., Cronk, L., Kirk Fox, L., Koukel, S., Le Menestrel, S., Monroe Lord, L., Reeves, C., Rennekamp, R., Rice, C., Rodgers, M., Samuel, J., Vail, A., & Warren, T. (2014). *Cooperative Extension’s national framework for health and wellness*.

https://nifa.usda.gov/sites/default/files/resource/Cooperative_extensionNationalFrameworkHealth.pdf

Brownson, R., & Jones, E. (2009). Bridging the gap: Translating research into policy and practice. *Preventive Medicine, 49*(4), 313–315.

<http://doi.org/10.1016/j.ypmed.2009.06.008>

Centers for Disease Control and Prevention. (2019). *High Obesity program*.

<https://www.cdc.gov/nccdphp/dnpao/state-local-programs/hop-1809/high-obesity-program-1809.html>

Community Preventive Services Task Force. (n.d.). *The community guide*.

<https://www.thecommunityguide.org/>

Dallman, A., Abercrombie, E., Drewette-Card, R., Mohan, M., Ray, M., & Ritacco, B. (2009). Elevating physical activity as a public health priority: Establishing core competencies for physical activity practitioners in public health. *Journal of Physical Activity and Health, 6*(6), 682–689. <http://doi.org/10.1123/jpah.6.6.682>

Durstine, L., Gordon, B., Wang, Z., & Luo, X. (2013). Chronic disease and the link to physical activity. *Journal of Sport and Health Science, 2*(1), 3–11.

<http://doi.org/10.1016/j.jshs.2012.07.009>

Economos, C. D., Anzman-Frasca, S., Koomas, A. H., Bakun, P. J., Brown, C. M., Brown, D., Folta, S. C., Fullerton, K. J., Sacheck, J. M., Sharma, S., & Nelson, M. E. (2019).

Dissemination of healthy kids out of school principles for obesity prevention: A RE-AIM analysis. *Preventive Medicine, 119*, 37–43. <http://doi.org/10.1016/j.ypmed.2018.12.007>

Edmunds, J. M., Beidan, R. S., & Kendall, P. (2014). Dissemination and implementation of evidence-based practices: Training and consultation as implementation strategies.

Clinical Psychology, 20(2), 152–165. <http://doi.org/10.1111/cpsp.12031>

Everette, A., & Harden, S. M. (2015). *Food and Fitness Initiative! Program evaluation final report*. Virginia Tech.

Folta, S., Koomas, A., Metayer, N., Fullerton, K., Hubbard, K., Anzman-Frasca, S., Hofer, T., Nelson, M., Newman, M., Sacheck, J., & Economos, C. (2015). Engaging stakeholders from volunteer-led out-of-school time programs in the dissemination of guiding principles for healthy snacking and physical activity. *Preventing Chronic Disease, 12*,

Article 150270. <http://doi.org/10.5888/pcd12.150270>

Frieden, T. (2010). A framework for public health: The health impact pyramid. *American Journal of Public Health, 100*(4), 590–595. <http://doi.org/10.2105/AJPH.2009.185652>

Greaves, C., Sheppard, K., Abraham, C., Hardeman, W., Roden, M., Evans, P., Schwarz, P., & The IMAGE Study Group. (2010). Systematic review of reviews of intervention components associated with increased effectiveness in dietary and physical activity interventions. *BMC Public Health, 11*, Article 119. <http://doi.org/10.1186/1471-2458-11-119>

- Harden, S. M., Balis, L. E., Strayer, T., III, Prosch, N., Carlson, B., Lindsay, A., Estabrooks, P., Dzewaltowski, D., & Gunter, K. (2020). Strengths, challenges, and opportunities for physical activity promotion in the century-old national Cooperative Extension System. *Journal of Human Sciences and Extension, 8*(3), 104–124.
<https://www.jhseonline.com/article/view/834/862>
- Harden, S. M., Gunter, K., & Lindsay, A. (2018). How to leverage your state's land grant Extension system: Partnering to promote physical activity. *Translational Journal of the American College of Sports Medicine, 3*(15), 113–118.
<http://doi.org/10.1249/TJX.0000000000000066>
- Harden, S. M., Ramalingam, N., Breig, S., & Estabrooks, P. (2019). Walk this way: Our perspectives on challenges and opportunities for Extension statewide walking promotion programs. *Journal of Nutrition Education and Behavior, 51*(1), 636–643.
<https://doi.org/10.1016/j.jneb.2018.12.010>
- Harden, S. M., Steketee, A., Glasgow, T., Glasgow, R., & Estabrooks, P. (2020). Suggestions for advancing pragmatic solutions for dissemination: Potential updates to evidence-based repositories. *American Journal of Health Promotion, 35*(2), 289–294.
<http://doi.org/10.1177/0890117120934619>
- Heath, G., Parra, D., Sarmiento, O., Andersen, L., Owen, N., Goenka, S., Montes, F., & Brownson, R. C. (2012). Evidence-based intervention in physical activity: Lessons from around the world. *Lancet, 380*(9838), 272–281. [http://doi.org/10.1016/S0140-6736\(12\)60816-2](http://doi.org/10.1016/S0140-6736(12)60816-2)
- Holston, D., Stroepe, J., Cater, M., Kendall, M., & Broyles, S. (2020). Implementing policy, systems, and environmental change through community coalitions and Extension partnerships to address obesity in rural Louisiana. *Preventing Chronic Disease, 17*, Article 190284. <http://doi.org/10.5888/pcd17.190284>
- Horodyska, K., Luszczynska, A., van den Berg, M., Hendriksen, M., Roos, G., De Bourdeaudhuij, I., & Brug, J. (2015). Good practice characteristics of diet and physical activity interventions and policies: An umbrella review. *BMC Public Health, 15*, Article 19. <http://doi.org/10.1186/s12889-015-1354-9>
- National Cancer Institute and Substance Abuse and Mental Health Services Administration. (n.d.). *Research-tested intervention programs*. <https://rtips.cancer.gov/rtips/index.do>
- Noonan, R. K., Wilson, K. M., & Mercer, S. L. (2012). Navigating the road ahead: Public health challenges and the interactive systems framework for dissemination and implementation. *American Journal of Community Psychology, 50*(3-4), 572–580.
<http://doi.org/10.1007/s10464-012-9534-6>
- Palmer-Keenan, D., & Corda, K. (2014). Should physical activity be included in nutrition education? A comparison of nutrition outcomes with and without in-class activities. *Journal of Extension, 52*(4).

- Peña-Purcell, N., Bowen, E., Zoumenou, V., Schuster, E., Boggess, M., Manore, M., & Gerrior, S. (2012). Extension professional's strengths and needs related to nutrition and health programs. *Journal of Extension, 50*(3).
- Physical Activity Guidelines Advisory Committee. (2018). *2018 physical activity guidelines advisory committee scientific report*. Office of Disease Prevention and Health Promotion, U.S. Department of Health and Human Services. <https://health.gov/our-work/physical-activity/current-guidelines/scientific-report>
- Powell, B. J., Waltz, T. J., Chinman, M. J., Damschroder, L. J., Smith, J. L., Matthieu, M. M., Proctor, E. K., & Kirchner, J. E. (2015). A refined compilation of implementation strategies: Results from the Expert Recommendations for Implementing Change (ERIC) project. *Implementation Science, 10*, Article 21. <http://doi.org/10.1186/s13012-015-0209-1>
- Proctor, E. K., Powell, B. J., & McMillen, J. C. (2013). Implementation strategies: Recommendations for specifying and reporting. *Implementation Science, 8*, Article 139. <http://doi.org/10.1186/1748-5908-8-139>
- Rabin, B. A., Brownson, R. C., Haire-Joshu, D., Kreuter, M. W., & Weaver, N. L. (2008). A glossary for dissemination and implementation research in health. *Journal of Public Health Management and Practice, 12*(2), 117–123. <http://doi.org/10.1097/01.PHH.0000311888.06252.bb>
- Ramalingam, N. S., Strayer, T. E., III, Breig, S. A., & Harden, S. M. (2019). How are community health workers trained to deliver physical activity to adults? A scoping review. *Translational Journal of the American College of Sports Medicine, 4*(6), 34–44. <http://doi.org/10.1249/TJX.0000000000000081>
- Spear, M., Rowland, B., Vincent, J., Brown, T., McElfish, P., Long, C., Presley, J., Wilson, A., Palenske, C., & Balis, L. E. (2020). *A feasibility demonstration for built environment changes to increase physical activity: Results of a community-based traffic calming event*. [manuscript submitted for publication]
- Strayer, T. E., III, Kennedy, L. E., Balis, L. E., Ramalingam, N. S., Wilson, M. L., & Harden, S. M. (2020). Cooperative Extension gets moving, but how? Exploration of Extension health educators' sources and channels for information-seeking practices. *American Journal of Health Promotion, 34*(2), 198–205. <https://doi.org/10.1177/0890117119879606>
- Tabak, R., Khoong, E. C., Chambers, D. A., & Brownson, R. (2012). Bridging research and practice models for dissemination and implementation research. *American Journal of Preventive Medicine, 43*(3), 337–350. <http://doi.org/10.1016/j.amepre.2012.05.024>
- Thompson, P., Arena, R., Riebe, D., Pescatello, L., & American College of Sports Medicine. (2013). ACSM's new preparticipation health screening recommendations from ACSM's guidelines for exercise testing and prescription (9th ed.). *Current Sports Medicine Reports, 12*(4), 215–217. <http://doi.org/10.1249/JSR.0b013e31829a68cf>
- U.S. Department of Agriculture. (n.d.). *Extension*. <https://nifa.usda.gov/extension>
- U.S. Department of Agriculture. (2010). *Healthy, Hunger-Free Kids Act of 2010*. <https://www.fns.usda.gov/school-meals/healthy-hungerfree-kids-act>

- U.S. Department of Agriculture. (2015). *The Farm Bill*.
<http://www.usda.gov/wps/portal/usda/usdahome?navid=farbill>
- U.S. Department of Agriculture. (2019). *SNAP-Ed toolkit: Obesity prevention interventions and evaluation framework*. <https://snapedtoolkit.org/>
- U.S. Department of Health and Human Services. (2018). *Physical activity guidelines* (2nd ed.).
https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf
- U.S. Department of Health and Human Services. (2020). *Move Your Way campaign*.
<https://health.gov/our-work/physical-activity/move-your-way-campaign>
- Wandersman, A., Duffy, J., Flaspohler, P., Noonan, R., Lubell, K., Stillman, L., Blachman, M., Dunville, R., & Saul, J. (2008). Bridging the gap between prevention research and practice: The interactive systems framework for dissemination and implementation. *American Journal of Community Psychology*, 41(3-4), 171–181.
<http://doi.org/10.1007/s10464-008-9174-z>
- Warburton, D., Nicol, C., & Bredin, S. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal*, 174(6), 801–809.
<http://doi.org/10.1503/cmaj.051351>
- Ward, B. W., Schiller, J. S., & Goodman, R. A. (2014). Multiple chronic conditions among US adults: A 2012 update. *Preventing Chronic Disease*, 11, Article 130389.
<http://doi.org/10.5888/pcd11.130389>
- Wilson, M. L., Strayer, T. E., III, Davis, R., & Harden, S. M. (2018a). Informed adaptations of a strength-training program through a research-practice partnership. *Frontiers in Public Health*, 6, Article 58. <https://doi.org/10.3389/fpubh.2018.00058>
- Wilson, M. L., Strayer, T. E., III, Davis, R., & Harden, S. M. (2018b). Use of an integrated research-practice partnership to improve outcomes of a community-based strength-training intervention for older adults: Reach and effect of Lifelong Improvements through Fitness Together (LIFT). *International Journal of Environmental Research and Public Health*, 15(2), Article 237. <https://doi.org/10.3390/ijerph15020237>
- Winkels, R., Artrip, R., Tupinio, M., Veldheer, S., Dandekar, S. C., & George, D. R. (2020). Opportunities for growth: Evaluating the feasibility of a community gardening intervention pairing adolescent and young adult cancer survivors with experienced gardeners. *Journal of Adolescent and Young Adult Oncology*, 9(1), 115–119.
<http://doi.org/10.1089/jayao.2019.0035>

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