

# Position of the Academy of Nutrition and Dietetics: The Role of Nutrition in Health Promotion and Chronic Disease Prevention

## ABSTRACT

It is the position of the Academy of Nutrition and Dietetics that primary prevention is the most effective and affordable method to prevent chronic disease, and that dietary intervention positively impacts health outcomes across the life span. Registered dietitians and dietetic technicians, registered are critical members of health care teams and are essential to delivering nutrition-focused preventive services in clinical and community settings, advocating for policy and programmatic initiatives, and leading research in disease prevention and health promotion. Health-promotion and disease-prevention strategies are effective at reducing morbidity and mortality and improving quality of life, and have a significant impact on the leading causes of disease. By applying these principles within a social ecological theoretical framework, positive influence can be applied across the spectrum of engagement: at intrapersonal, interpersonal, institutional, community, and public policy levels. Through the application of efficacious and cost-effective interventions, registered dietitians and dietetic technicians, registered, can positively impact public health as well as health outcomes for the individuals that they counsel. This position paper supports the “Practice Paper of the Academy of Nutrition and Dietetics: The Role of Nutrition in Health Promotion and Chronic Disease Prevention” published on the Academy’s website at: [www.eatright.org/positions](http://www.eatright.org/positions).

*J Acad Nutr Diet.* 2013;113:972-979.

## POSITION STATEMENT

It is the position of the Academy of Nutrition and Dietetics that primary prevention is the most effective and affordable method to prevent chronic disease, and that dietary intervention positively impacts health outcomes across the life span. Registered dietitians and dietetic technicians, registered, are critical members of health care teams and are essential to delivering nutrition-focused preventive services in clinical and community settings, advocating for policy and programmatic initiatives, and leading research in disease prevention and health promotion.

**T**HIS POSITION PAPER SUPPORTS the “Practice Paper of the Academy of Nutrition and Dietetics: The Role of Nutrition in Health Promotion and Chronic Disease Prevention” published July 2013 on the Academy website at: [www.eatright.org/positions](http://www.eatright.org/positions).<sup>1</sup> For several decades, the evidence demonstrating that many chronic diseases are preventable through lifestyle has been mounting and now is strong, compelling, and warrants action. As risk factors and subsequent diseases can begin early in life, health promotion and disease prevention (HPDP) efforts are imperative for delaying premature death, improving quality of life, and lessening the economic burden on the health care system. A healthy lifestyle is a cornerstone of these efforts. A systematic review of published reports has demonstrated the essential role of primary prevention in improving longevity and quality of life and in delaying health

care costs.<sup>2</sup> Lifestyle interventions have been found to be cost effective for the prevention of diabetes<sup>3</sup> and cardiovascular disease (CVD).<sup>2</sup> Furthermore, optimal nutrition has been shown to play a central role in obesity prevention.<sup>4,5</sup> In addition, nutrition interventions have been shown to provide targeted effective intervention in secondary and tertiary prevention of disease.<sup>6-11</sup>

Registered dietitians (RDs) are uniquely equipped to provide essential HPDP interventions,<sup>12-15</sup> and dietetic technicians, registered (DTRs) offer value-added support to RDs and to dietary intervention teams that enhance the provision of preventive services.<sup>16,17</sup> Based on a systematic review of the scientific evidence completed by the Academy of Nutrition and Dietetics Evidence Analysis Library,<sup>12</sup> there is strong evidence to support the cost effectiveness of outpatient medical nutrition therapy (MNT) services provided by an RD in patients with obesity, diabetes, disorders of lipid metabolism, and other chronic conditions. A review of the impact of nutrition interventions and

counseling provided by an RD, when part of a health care team, yielded strong evidence of the positive impact that RDs can have on weight, blood pressure, serum lipids, and glycated hemoglobin.<sup>13</sup> Although some reports supported the effectiveness of MNT by RDs over other health care professionals,<sup>14,15</sup> Evidence Analysis Library findings were inconclusive related to evidence to support effectiveness of MNT by RDs over other health care professionals due to variations in intervention length and outcome measures in studies reviewed.<sup>18</sup>

## CHRONIC CONDITIONS RELATED TO DIETARY CONSUMPTION

Multiple disease states and their detrimental effects on morbidity and mortality can be prevented or minimized with effective and timely dietary and lifestyle intervention, as well as with policy initiatives designed to address the underlying causes of environments that foster poor dietary and physical activity patterns.

2212-2672/\$36.00  
doi: 10.1016/j.jand.2013.05.005

## Overweight and Obesity

The prevalence of overweight and obesity has taken on epidemic proportions for both males and females across all age and ethnic groups in the United States.<sup>19</sup> More than 16% of children aged 6 to 19 years are obese, with body mass index (BMI) levels  $\geq$ 95th percentile for age and sex.<sup>19</sup> One in three adults in the United States are obese.<sup>20</sup>

In a systematic review and meta-analysis, Guh and colleagues found evidence to support a link between excess body weight and type 2 diabetes; cancers of the breast, endometrium, ovaries, colon, rectum, and kidney; hypertension; coronary artery disease; stroke; asthma; gallbladder disease; and osteoarthritis.<sup>21</sup> Primary prevention of obesity is an essential goal for improving population health, and has demonstrated effectiveness, especially among children and youths.<sup>22</sup> Targeted intervention on obesity through secondary and tertiary methodologies has established effectiveness.<sup>23</sup>

Not surprisingly, the economic burden for the medical treatment of obese adults in the United States is estimated at approximately \$147 billion per year.<sup>24</sup> These costs arise from impaired quality of life and increased risk for CVDs (eg, hypertension, coronary heart disease, stroke, and heart failure), metabolic disease (eg, insulin resistance and type 2 diabetes), some cancers, obstructive sleep apnea, gastrointestinal disease (eg, gallbladder and liver disease), degenerative diseases (eg, arthritis), and asthma.<sup>25</sup> Not only is morbidity affected by excess body weight, but mortality is also impacted, as 1 in 10 modifiable deaths are attributed to overweight/obesity.<sup>26</sup> Therefore, early prevention efforts are warranted and can begin by addressing lifestyle variables that can predispose an individual to becoming overweight or obese. Similarly, primary prevention and policy efforts should address the current obesogenic environment that promotes positive energy balance.<sup>27</sup> Systematic reviews of the clinical and cost effectiveness of obesity interventions have shown that weight-management programs do promote small amounts of weight loss in overweight individuals,<sup>4,5</sup> with programs that focus on environmental change being the more cost effective.<sup>4</sup> Potential cost savings through obesity prevention have been

shown to be significant. In forecasting obesity trends through 2030, Finkelstein and colleagues found that for a 1% decline from anticipated obesity trajectories, obesity-related medical costs would drop by \$84.9 billion ( $\pm$ \$9.3 billion) by 2030.<sup>28</sup>

## Cardiovascular and Cerebrovascular Disease

CVD has been the leading cause of death in the United States for more than 100 years<sup>25</sup> and currently accounts for 1 in 3 deaths, and cerebrovascular disease accounts for 1 of every 18 deaths in the United States.<sup>25</sup> The cost associated with medical treatment and lost productivity from CVD alone was \$297.7 billion in 2008, which is more than any other disease.<sup>25</sup>

Risk factors for CVD that can be improved by dietary intervention include dyslipidemia, glucose intolerance, hypertension, and obesity.<sup>25</sup> Although the positive impacts of dietary change have been clearly demonstrated, <1% of US adults have a diet considered ideal when compared with American Heart Association 2020 goals.<sup>25</sup>

The American Heart Association endorses the role of public policy and community-based efforts toward primary prevention of CVD.<sup>2</sup> With regard to intervention via primary care settings, the US Preventive Services Task Force<sup>29</sup> (USPSTF) notes that the benefits of behavioral counseling care for primary prevention of CVD in this venue are small. For patients with hypercholesterolemia, however, MNT has been found to be cost effective compared with usual care by physicians.<sup>14</sup>

## Diabetes Mellitus

The prevalence of diabetes, particularly type 2 diabetes, has increased during the last decade. More than 18 million US adults (8%) were diagnosed with diabetes in 2008,<sup>25</sup> and diabetes prevalence is projected to reach 33% by 2050.<sup>30</sup> What was once considered an adult-onset condition is being seen with increasing frequency among children and youths.<sup>31</sup> Among adolescents aged 12 to 19 years, 12.7% have been reported to have metabolic syndrome,<sup>32</sup> which predisposes these individuals to risk of type 2 diabetes in young adulthood and beyond.<sup>33</sup> In addition, 0.05% to 5% of youths have dia-

betes, with higher prevalence numbers attributed to older age and obesity.<sup>32</sup> Rates of diabetes are considerably higher among minority populations.<sup>25</sup>

Based on 2005-2006 National Health and Nutrition Examination Survey data, approximately 40% of those with diabetes were undiagnosed cases.<sup>34</sup> One in three Americans were found to be at risk for diabetes based on impaired fasting glucose or impaired glucose tolerance.<sup>34</sup> Therefore, the need for screening for diabetes is evident. Obesity and family history are the main predictors of type 2 diabetes.<sup>32</sup> Hypertension, low high-density lipoprotein cholesterol, and high triglyceride levels are also predictive of type 2 diabetes risk.<sup>35</sup> Lifestyle behaviors such as dietary patterns and physical activity are linked to type 2 diabetes risk as well,<sup>36</sup> and lifestyle modification has been effective in preventing or delaying diabetes onset among individuals with pre-diabetes.<sup>37</sup>

## Cancer

Cancer incidence rates have decreased for both men and women across all racial and ethnic groups except for American Indian/Alaska Native women, where rates were stable from 2000 to 2010.<sup>38</sup> Although death rates from cancer have also decreased, cancer claims more lives than heart disease among individuals younger than 85 years of age.<sup>38</sup> Excessive adiposity, poor dietary patterns, and physical inactivity are risk factors that contribute to incidence of several common cancers: colon, breast, uterine, esophageal, and renal cancers.<sup>39</sup> Obesity/overweight is implicated in 14% of cancer deaths in men and 20% of cancer deaths in women.<sup>39</sup> Alcohol intake at rates beyond that considered moderate has been shown to increase the risk of several cancers, including mouth, esophagus, pharynx, larynx, liver, and breast. Moderate drinking is defined as one daily drink for women, two drinks per day for men.

Dietary interventions have shown promise for primary prevention of some types of cancer.<sup>40,41</sup> Physical activity also plays an important role in cancer prevention.<sup>39</sup> Dietary modifications to reduce fat intake demonstrate effectiveness at reducing the risk of cancer of the breast<sup>41</sup> and ovary.<sup>40</sup> Regular moderate to vigorous physical ac-

tivity results in a 30% reduction of colon cancer risk.<sup>39</sup>

### Osteoporosis

The prevalence of osteoporosis has been estimated at 8% among US women 20 years of age and older.<sup>42</sup> Optimization of bone mass is essential for the prevention of fractures in both adolescents and the elderly. Prevention of fractures has been found to be strongly related to calcium and vitamin D intake, as well as to regular weight-bearing physical activity.<sup>43</sup> A systematic review of the role of these dietary factors has further validated the positive impact that they can have on the prevention of osteoporosis.<sup>44</sup> Because osteoporosis and periodontal disease are related, dietary habits can impact alveolar bone loss just as they do bone mineral density.<sup>45</sup>

### SOCIAL ECOLOGICAL PERSPECTIVE AS A FRAMEWORK FOR HPDP

HPDP can be implemented at primary, secondary, or tertiary levels. Primary prevention refers to the approaches that aim to prevent the disease risk factors such as obesity, less-healthy dietary intake patterns, or physical inactivity. Secondary prevention involves “early detection and prompt intervention” of health issues or diseases (eg, preventing type 2 diabetes among those who are obese and physically inactive or have prediabetes). Tertiary prevention focuses on disease management to prevent the complications among those who are already diagnosed.<sup>46</sup>

Whether it is a primary, secondary, or tertiary intervention, ideal HPDP approaches should be multifactorial and encompass both individual and environmental determinants of health and disease because individuals’ behaviors are influenced by the physical and social environment. For example, environmental characteristics, such as less walkable or low socioeconomic status (SES) neighborhoods, have been linked to less physical activity or higher prevalence of overweight or obesity.<sup>47</sup> Access to a variety of affordable and healthy foods can be limited in rural or certain urban settings (eg, food deserts), which in turn are likely to influence food intake behaviors.<sup>48,49</sup> Neighborhoods

with low SES are characterized by lower access to supermarkets and higher density of fast-food restaurants. Access to supermarkets has been positively related to diet quality, and higher fast-food consumption or living in areas with higher concentration of fast-food restaurants has been linked to higher type 2 diabetes incidence,<sup>50</sup> body weight,<sup>51,52</sup> waist circumference, and plasma triglycerides, and lower high-density lipoprotein cholesterol concentrations among adults.<sup>52</sup>

The relationship between environment and health also has a social dimension. The association between neighborhood-level poverty and self-reported health has been reported to be partially mediated by social support, social capital, and social and physical disorder (ie, antisocial behavior of residents and deterioration of built environment) in the neighborhood.<sup>53</sup>

Virtual influences within the environment (ie, media) are also likely to influence food intake behaviors and health outcomes. Exposure to energy-dense, nutrient-poor food advertisements has been shown to have a negative effect on food requests made by children.<sup>54</sup> High levels of screen time can contribute to overweight or obesity by replacing more physically demanding activities. In 2009, American children spent an average of 7.4 hours per day watching media (television, computers, video games, movies, etc), and this was even higher for minority children.<sup>55</sup> Although there have been some variations by age and sex, numerous studies have linked sedentary or screen time and number of media resources in the household to overweight or obesity<sup>56,57</sup> and detrimental impacts on physical fitness<sup>58</sup> among children and youth.

HPDP approaches must be able to respond to this multifactorial context. The Institute of Medicine recommends using a multifactorial, “systems perspective” to effectively address public health challenges.<sup>59</sup> Social ecological models can be useful in this context because they emphasize both individual and environmental factors as well as the interactions between factors.<sup>60</sup> A social ecological framework can be used to address the factors related to health and disease at the individual or intrapersonal level (eg, individuals’ knowledge, beliefs, self-efficacy, or

skills), interpersonal (family or peer level influences), and community or institution levels (eg, school food environment, worksite policies, vending machines, food outlets within neighborhoods). In addition, social ecological models include public policy or society-level factors (eg, Dietary Guidelines for Americans [DGA], food labeling, pricing, agricultural, or federal assistance regulations).<sup>61</sup> Because of its multidimensional nature, social ecological models are readily applicable to complex and multifactorial HPDP efforts. In addition, the ability of these models to effectively encompass multiple aspects of areas targeted for intervention has fostered their use in defining federal guidelines for addressing HPDP efforts. See the Academy of Nutrition and Dietetics HPDP practice paper for specific guidelines and examples across the various levels of the social ecological framework.<sup>1</sup>

### FEDERAL GUIDELINES FOR HPDP

#### Healthy People 2020

For the past 30 years, national priorities for improving the health of the US population have been the focus of Healthy People. Developed as a collaborative effort of federal agencies, public stakeholders, and advisory committee members, these objectives serve as a guiding framework for improving health outcomes. Healthy People 2020 was released in December 2010, with these goals as primary foci:

1. attain high-quality, longer lives free of preventable disease, disability, injury, and premature death;
2. achieve health equity, eliminate disparities, and improve the health of all groups;
3. create social and physical environments that promote good health for all; and
4. promote quality of life, healthy development, and healthy behaviors across all life stages.<sup>62</sup>

A new topic area included in Healthy People 2020 is that of older adults with the goal of improving their health, functionality, and quality of life.<sup>62</sup>

HPDP are crucial elements of many of the almost 600 objectives included in Healthy People 2020. Nutrition and weight status are among the 42 major topic areas addressed, with nutrition-

related issues integral to 13 additional topic areas. Such topics include issues across the life cycle as well as disease states including diabetes, heart disease and stroke, cancer, arthritis, and respiratory diseases. Nutrition-related preventive emphasis areas include food safety, oral health, and physical activity.

## DGA

The DGA serve as the basis for federal food and nutrition education programs, and they are intended to provide sound, research-based recommendations to individuals and groups regarding HPDP. They are revised every 5 years, and the 2010 DGA<sup>63</sup> were released in December 2010 by the US Department of Agriculture and the US Department of Health and Human Services. The US Department of Agriculture Nutrition Evidence Library was used to carry out evidence-based, systematic reviews of issues related to the DGA.<sup>63</sup>

Recommendations highlighted in the report focus on the integration of a lifestyle approach to health and wellness across the life span; one that incorporates energy-balanced and nutrient-dense dietary patterns. The report emphasizes four major findings that the Dietary Guidelines Advisory Committee recognizes as essential to encouraging all Americans to adopt health-promoting nutrition and physical activity guidelines:

1. reduce the prevalence of overweight and obesity by reducing overall calorie intake and increasing physical activity;
2. consume more plant-based foods, seafood, and more fat-free or low-fat dairy products;
3. significantly reduce the intake of foods containing added sugars and solid fats; and
4. meet the 2008 Physical Activity Guidelines for Americans.<sup>63</sup>

## The USPSTF

The USPSTF, which is supported by the US Department of Health and Human Services, is an independent panel of non-federal experts in disease prevention and primary medical care that conducts scientific evidence reviews of preventive health care services and provides insights into best practices.

In *The Guide to Clinical Preventive Services 2012*, the USPSTF summarizes the

most recent recommendations for primary, secondary, and tertiary prevention of chronic health conditions such as obesity, hyperlipidemia, and other CVD risk factors. The USPSTF recommends screening all adults for obesity and recommends comprehensive weight-loss and behavior-management programs for obese adults.<sup>64</sup> In *The Guide to Clinical Preventive Services 2012*, the USPSTF recommended intensive behavioral dietary counseling for adult patients with hyperlipidemias and other CVD risk factors, and indicated that such counseling should be provided by primary care clinicians or by specialists such as RDs or DTRs.<sup>64</sup> *The Guide to Community Preventive Services*, also from the USPSTF, noted that technology-supported, multi-component community interventions for weight loss and weight maintenance were effective.<sup>65</sup> Worksite programs were also recommended, with cost-effectiveness estimates ranging from \$1.44 to \$4.16 per pound of body weight lost.

They also reported that diabetes self-management education was effective, but the venues recommended varied, depending on patient characteristics. For adults with type 2 diabetes, implementation in community gathering places was effective. Among children and adolescents with type 1 diabetes, such interventions were best implemented in the home. Insufficient evidence exists as to whether other venues, such as recreational camps, worksites, or school settings are efficacious.<sup>65</sup>

## National Prevention Strategy

*The National Prevention Strategy: America's Plan for Better Health and Wellness* was developed by the National Prevention Council, which is supported by the Affordable Care Act. This report reflects the efforts of federal agencies to shift the focus of health care from problem-based medicine to one of prevention and wellness. The report summarizes the policy implications and recommended strategies to support preventive services and healthy environments, to empower people through education and motivation toward healthy choices across the life span, and to eliminate health disparities.<sup>59</sup>

## COST EFFECTIVENESS OF HPDP INTERVENTIONS

MNT is the legal definition of nutrition counseling provided by an RD. MNT has been shown to be cost effective, resulting in improved clinical outcomes, enhanced quality of life, and reduced costs for patients with obesity and type 2 diabetes,<sup>66,67</sup> as well as in those with dyslipidemia.<sup>14,68</sup> Nutrition counseling for consumption of a low-fat diet for cancer prevention (breast and ovarian)<sup>40</sup> has also been found to be both clinically effective<sup>40</sup> and cost effective.<sup>69</sup> Findings from the Diabetes Prevention Program clinical trial provide evidence of the cost effectiveness of intervention as delivered by an RD. In a comparison of lifestyle intervention to metformin use among individuals with impaired glucose tolerance, costs from a societal perspective were found to be \$24,400 and \$34,500, respectively, for each case of diabetes delayed or prevented.<sup>3</sup> Furthermore, from the perspective of health system costs, although the lifestyle intervention was found to be more expensive for the first year of implementation, it was found to be less expensive in years 2 and 3 of the intervention, and was forecast to continue to be more cost effective relative to the administration of metformin beyond 3 years.<sup>67</sup>

## LIFE-CYCLE PHASES AND POPULATION SUBGROUPS FOR HPDP

### Racial/Ethnic Minorities and Immigrants

HPDP is critical for many of the minority groups in the United States because they face disparities in chronic disease and disease risk factor prevalence, and health care and outcomes. Hispanics, blacks, Asian Americans, and Native Americans are at increased risk for type 2 diabetes in comparison with non-Hispanic whites,<sup>70</sup> and higher morbidity and mortality rates for several other diseases have been highlighted in an earlier practice paper.<sup>71</sup> Racial/ethnic disparities exist in exposure to disease risk factors as well. In comparison with non-Hispanic whites, obesity is more prevalent among blacks and Hispanics, physical inactivity during leisure time is more common among Hispanics, and cigarette smoking is more prevalent among American Indian/Alaska Na-

tives.<sup>70,72</sup> Similarly, higher rates of overweight or obesity and physical inactivity, more hours of television viewing, and less healthy dietary intake patterns have been reported among minority children and adolescents.<sup>73</sup>

When considering health outcomes among immigrants, a potential influence of acculturation must be noted. For example, cancer prevalence is reported to be higher for some cancer types (eg, stomach, brain) and lower for others (eg, breast, prostate, lung, colon) among foreign-born vs US-born individuals.<sup>74</sup> Among Hispanics, lower levels of acculturation have been shown to be linked to lower prevalence of obesity, hypertension, CVD, as well as healthier dietary intake patterns and lower rates of cigarette smoking and alcohol consumption (among women).<sup>75</sup> These disease risk profiles can be negatively influenced by poorer access to and use of health care services (eg, physical activity or diet-related advice,<sup>76</sup> diabetes education<sup>77</sup>) and communication barriers<sup>70</sup> among less (vs more) acculturated Hispanics.

### Persons with Low SES

Low SES is related to many health-related outcomes, such as poorer self-reported health and higher rates of CVD, diabetes, obesity, and cigarette smoking.<sup>25,78</sup> Worse access to health care, lower quality of care, communication barriers with the health care providers, and a higher rate of hospitalizations are more common among individuals with lower (vs high) SES.<sup>70</sup> Low SES during childhood has been linked to an increased risk of CVD in adulthood independent of SES during adult years.<sup>79</sup> SES differences explain substantial proportions of some of the racial/ethnic health disparities, but do not completely explain the disparities in diabetes prevalence, access to care, BMI, or physical activity.<sup>80</sup> In addition, socioeconomic characteristics of health care facilities, rather than of individuals, appear to have a stronger influence in some of the health disparities.<sup>81</sup> In relationship to SES, food insecurity is of specific concern because it is more prevalent among individuals with low SES and minorities (eg, Hispanics and blacks),<sup>82</sup> and it has been linked to poor dietary intake and health outcomes, including obesity (among women)<sup>83</sup> and type 2 diabetes.<sup>84</sup>

### Maternal and Infant Health

Recent research findings have underscored the importance of the prenatal period for subsequent optimal growth and the prevention of obesity among offspring. Relationships have been observed between low birth weight and adult-onset hypertension, diabetes, obesity, and CVD.<sup>85</sup> Maternal obesity has been linked to increased risk of metabolic syndrome in offspring.<sup>86</sup> Three to five percent of women might develop gestational diabetes, and these women in turn have a higher risk of developing type 2 diabetes later in life.<sup>87</sup> Breastfeeding has been shown to promote healthy weights among children and has been encouraged by the Centers for Disease Control and Prevention's Division of Nutrition, Physical Activity, and Obesity as a way to reduce the likelihood of developing asthma and infections.<sup>88</sup> In addition, breastfeeding can help mothers attain a healthy weight after pregnancy and reduce the risk of certain cancers<sup>88</sup> and type 2 diabetes.<sup>89</sup>

### Early and Middle Childhood

Behaviors established in childhood predict health outcomes over the life span, and obesity in childhood predicts obesity in adulthood.<sup>88</sup> Similarly, risk factors such as total cholesterol, triglycerides, blood pressure, and BMI, evident as early as age 9 years have been shown to be predictive of subsequent subclinical atherosclerosis in adulthood.<sup>90</sup> The Academy of Nutrition and Dietetics position paper on the role of individual-, family-, school-, and community-based interventions for pediatric overweight<sup>91</sup> provides evidence of the effectiveness of intervention for pediatric populations.

### Adolescent Health

Adolescence is a period characterized by rapid physical change as well as by substantial personal and interpersonal transitions. Attention to HPDP in the stage of life that defines this transition from childhood to adulthood is crucial. From the development of obesity and atherosclerosis to the accrual of peak bone mass, the dietary and physical activity choices made by children aged 10 to 19 years have implications for their longevity and quality of life.<sup>92</sup> Recent evidence suggests that youths often

make poor behavior choices. In 2011, only 34% of US high school students consumed fruit or fruit juice at least twice a day in the past week, and 28.3% reported eating vegetables two or more times daily. In addition, 85% did not consume at least 3 cups of milk a day. Only 28.7% reported daily physical activity of at least 60 minutes per day during the past week.<sup>92</sup>

### Adult Health

According to national trend data of CVD risk factors by BMI level, the prevalence of CVD risk factors has declined during the past 30 years at all levels of BMI, although obese individuals maintain increased risk levels of CVD.<sup>93</sup> Low CVD risk was characterized as not smoking, not needing cholesterol-lowering drugs or antihypertensives, being at a healthy weight, and not having a diagnosis of diabetes. These conditions have important implications for longevity and quality of life. Chronic health conditions will take on increased significance as the US population ages. Central to the mission of Healthy People 2020 is that the population lives long lives that are free of disability and preventable disease.<sup>62</sup> Emphasis has been placed on the need for early and effective intervention and referral to ensure adherence to needed lifestyle modifications. The Academy of Nutrition and Dietetics recently released its "Position of the Academy of Nutrition and Dietetics: Food and Nutrition for Older Adults: Promoting Health and Wellness,"<sup>94</sup> in which HPDP was emphasized in promoting quality of life, health, and wellness into old age.

### PHYSICAL ACTIVITY AND ITS ROLE IN HEALTH PROMOTION

Recent recommendations for incorporating physical activity across the life cycle provide guidelines for individuals: children and adolescents should engage in 1 hour of physical activity every day, while adults need to incorporate 2.5 hours of moderate intensity physical activity or 75 minutes (1 hour and 15 minutes) of vigorous aerobic activity each week.<sup>95</sup> Older adults should also be counseled to follow the same guidelines, taking into consideration any existing health conditions.<sup>95</sup>

## CONCLUSIONS

Optimal health is achieved through the establishment of healthy lifestyles early in life, which over time can prevent the occurrence and severity of chronic diseases, reduce premature mortality, and improve quality of life. Strong evidence exists for the need for early and effective HPDP strategies applied at multiple levels of influence across the social ecological framework. RDs and DTRs are critical members of multifactorial and multidisciplinary HPDP efforts. Across the spectrum from intrapersonal to societal-level influence, RDs and DTRs are uniquely qualified to provide nutrition education and interventions that can promote healthy lifestyles among children and adults in a cost-effective manner.

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We thank the reviewers for their many constructive comments and suggestions. The reviewers were not asked to endorse this position or the supporting paper.