women's sports foundation
founded by Billie Jean King

The Women's Sports Foundation Report:

Her Life Depends On It: Sport, Physical Activity and the Health and Well-Being of American Girls

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About the Women's Sports Foundation

Founded in 1974 by Billie Jean King, the Women's Sports Foundation is a national charitable educational organization seeking to advance the well-being and leadership skills of girls and women through sports and physical activity. The Foundation's Participation, Education, Advocacy, Research and Leadership programs are made possible by gifts from individuals, foundations and corporations. The Foundation is located in Nassau County, N.Y. For more information, please call the Foundation at (800) 227-3988 or visit www.WomensSportsFoundation.org or AOL Keyword: WSF. The Foundation serves as a center for collecting and sharing information on girls and women in sports and physical activity. The Women's Sports Foundation also produces quality academic research on the psychological, social and physiological dimensions of sport and physical activity in the lives of girls and women.

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Authorship and Acknowledgments

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Executive Summary

This report is a comprehensive compendium of research that points to physical activity and sport as fundamental solutions for many of the serious health and social problems faced by American girls.

An appreciable mass of evidence-based knowledge about girls' involvement with sport and physical activity has been generated during the last decade. The amount and quality of this research are uneven and varied. For example, a good deal of research examines the associations between physical activity and risk for coronary heart disease, but studies that focus on risk for Alzheimer's disease are just beginning to issue. Researchers have verified links between high school athletic participation and teen pregnancy prevention, although more longitudinal research is needed to thoroughly confirm the connections. Overall, however, this report shows that the current state of knowledge on the relationship of physical activity to the health and social needs of American girls warrants the serious attention of public health officials, educators and sport leaders.

American girls are confronted by a daunting array of health risks in their youth and in later life:

- **Obesity:** In 1970, only one out of every 21 girls was obese or overweight; today that figure is one in six (National Center for Health Statistics, 2002).
- **Heart Disease:** Cardiovascular disease is the number-one cause of death among American women (44.6% of all deaths), and the death rate is 69% higher for black women than for white women (American Heart Association, 2003).
- **Cancer:** Breast cancer is the most common cancer among women, accounting for nearly one of every three cancers diagnosed in American women (American Cancer Society, 2003).
- **Osteoporosis:** Of the 10 million Americans estimated to have osteoporosis, eight million are women (National Osteoporosis Foundation, 2003).
- **Tobacco Use:** In grades 9-12, 29.5% of female students report current tobacco use (Centers for Disease Control and Prevention, 2002).
- **Drug Use:** Thirty-eight percent of 12th-grade girls and 18% of eighth-grade girls have used an illicit drug at least once during the past year (Johnston, O'Malley and Bachman 2002).
- **Sexual Risk:** About 1/4 of sexually active adolescents are infected with a sexually transmitted disease each year (Kirby, 2001).
- **Teen Pregnancy:** The United States has the highest teen pregnancy and birth rates in the industrialized world. About 80% of teen pregnancies are unintended (National Campaign to Prevent Teen Pregnancy, 2002).
- **Depression:** By age 15, girls are twice as likely as boys to have experienced a major depressive episode. This gender gap continues for the next 35 to 40 years, until menopause (Cyranowski et al, 2000).
- **Suicide:** In 2001, about one in four U.S. high school girls seriously considered suicide, and one in 10 actually attempted to kill herself (National Center for Health Statistics, 2003).
- **Pathogenic Weight Loss Behavior:** Over 90% of victims of eating disorders are female, and 86% report onset by age 20 (National Association of Anorexia Nervosa and Associated Disorders, 2004).

The U.S. Institute of Medicine has defined the mission of public health as "fulfilling society's interest in assuring conditions in which people can be healthy" (Committee for the Study of the Future of Public Health, 1988). This research compiled in this report strongly suggests that sport and physical activity provide conditions that help to assure girls' health and well-being. Some findings identified in this report include:

- **Breast Cancer Risk:** One to three hours of exercise a week over a woman's reproductive lifetime (the teens to about age 40) may bring a 20-30% reduction in the risk of breast cancer, and four or more hours of exercise a week can reduce the risk almost 60% (Bernstein et al, 1994).

- **Smoking:** Female athletes on one or two school or community sports teams were significantly less likely to smoke regularly than female non-athletes. Girls on three or more teams were even less likely to smoke regularly (Melnick et al, 2001).

- **Illicit Drug Use:** Two nationwide studies found that female school or community athletes were significantly less likely to use marijuana, cocaine or most other illicit drugs, although they were no less likely to use crack or inhalants. This protective effect of sports was especially true for white girls (Miller et al, 2000; Pate et al, 2000).

- **Sexual Risk:** Female athletes are less likely to be sexually active, in part because they tend to be more concerned about getting pregnant than female non-athletes (Dodge & Jaccard, 2002).

- **Depression:** Women and girls who participate in regular exercise suffer lower rates of depression (Nicoloff and Schwenk, 1995; Page and Tucker, 1994).

- **Suicide:** Female high school athletes, especially those participating on three or more teams, have lower odds of considering or planning a suicide attempt (Sabo et al, 2004).

- **Educational Gains:** The positive educational impacts of school sports were just as strong for girls as for boys including self-concept, educational aspirations in the senior year, school attendance, math and science enrollment, time spent on homework, and taking honors courses (Marsh, 1993).

Despite the growing research evidence, girls do not have enough encouragement or opportunity to participate in sports and fitness activities. Nearly one out of every two high school boys plays sports, while only one in three high school girls participates. (National Federation of State High School Associations, 2003) Special interventions aimed at increasing the physical activity level of girls are essential (National Women's Law Center & Harvard School of Public Health, 2004). Every girl deserves the opportunity to be healthy, happy and herself. But the solutions to meeting girls' health needs stretch far beyond education and individual choice. There has been a serious erosion of infrastructural supports for physical fitness and athletics.

- **Sedentary School Life:** Recess and physical education are disappearing from urban schools, and only about one-third of students nationwide attend physical education class daily.

- **Safety Concerns:** Parents worry about the safety of their young daughters who attend after-school exercise or sport programs.

- **Lack of Women in Leadership:** The majority of youth programs and drop-in centers for older children and adolescents have male-oriented, if not male-dominated cultures.

- **Persistent Inequalities:** Gender inequalities remain a feature of the sport and physical activity landscape. In many towns and cities, the parks and recreation departments are serving more boys than girls. Very few high schools and universities are providing participation opportunities for female athletes in proportion to the number of women in the general student body.

- **Lack of Space and Facilities:** In urban areas the amount of available space for exercise and athletics is often limited. Advocates for girls' programs, moreover, often have to compete with politically entrenched male administrators of boys' programs for a share of the available courts, swimming pools and fields.

This report shows that this backsliding is not just about failing to provide more girls with athletic and fitness opportunities—it's about endangering the public health.

Health processes and outcomes are influenced by a multitude of factors. While researchers have made admirable progress identifying links between physical activity and girls' health, the scientific journey has just begun. And researchers are also learning more about the negative health outcomes associated with sport and exercise: e.g., overtraining can lead to permanent injury; female athletes in certain sports are especially prone to develop eating disorders; female college athletes binge drink more often than female non-athletes. Research findings that pertain to both favorable and unfavorable health impacts from sport and exercise are included in this report.

Economic inequalities exert powerful influences on health and illness. Not all girls have the same sports and fitness opportunities due to the economic circumstances of their families, schools, and communities. As some of the findings in this report suggest, the fitness and athletic experiences of poor girls and many girls of color are often mediated by poverty and racial discrimination.

The knowledge that physical activity and sport can help to prevent illness and problem behaviors is only the first step in enhancing the health and well-being of American girls. Knowledge must be transformed into policies and practice. Meeting the challenge of inactivity among girls will require a consistent, diverse and multifaceted commitment.

Introduction

Title IX of the Education Amendments Act of 1972 required equal opportunity for female athletes in government-funded institutions, and served as a wakeup call to American schools and communities. The legal message was that girls deserved their fair share of the fun, challenges, and opportunities that sports mainly provided to boys. Many mothers and fathers seized the banner of equal athletic opportunity on behalf of both their daughters and sons. Yet, despite the astronomical increases in the number of girls and women participating in sports during the 1970s and 1980s (up from 1 in 27 participating to 1 in 3 in high schools), barriers to full participation persisted. These included scientifically discredited assumptions about feminine frailty and assumptions that girls 'naturally' lacked interest in sports, as well as more concrete organizational barriers such as the male-domination of the primary athletic organizations from Little League Baseball to the National Collegiate Athletic Association.

The actual implementation of Title IX lagged until the 1990s, when lawsuits and court battles became a successful means of enforcement. Simultaneously in American culture at large, girls and women became the primary participants in the fitness revolution, creating a vision of health that linked sound nutritional practices with vigorous physical activity. The increased participation rates were a sign of positive change, but ironically, the United States witnessed an alarming increase in childhood and adolescent obesity. Too many girls, it seems, were sitting out the fitness movement and missing out on the growth of women's sports.

Researchers were somewhat slow off the mark when it came to systematically studying these changing patterns of girls' and women's lives in relation to sport and exercise. Knowledge production fell behind the rapid individual and institutional changes. While some pioneering researchers recognized the revolutionary gender changes in sport, it was not until the 1990s that educators, epidemiologists, medical researchers, psychologists, public health analysts and sociologists created a substantial pool of knowledge on the real and potential contributions that sports and fitness involvement are making in the lives of girls and young women. The publication of a special report on girls by the President's Council on Physical Fitness and Sport in 1997 was a signal that a new era of scholarly awareness was issuing.

In contrast to the 1980s, public health officials, educators, and policy makers now have a significant body of research that documents the benefits of physical activity and sport for women and girls. A tidal shift is occurring in discussions of Title IX. Important issues on gender in sport once revolved around the distribution of athletic budgets, practice times, playing fields and media recognition. But these debates are increasingly informed by broader considerations relating to health, psychological well-being, academic achievement and educational and career mobility. The new research on sport and physical activity is fueling an overarching perception and policy position that more girls and young women need to be afforded opportunities for participation *because their lives depend on it*. It is the preventive potential of sports and exercise in girls' lives that is the core of this report.

Evidence-based research on the positive contributions of sports and physical activity to girls' lives is fomenting an important awareness in the debates about gender equity in athletics. The issue is no longer whether girls are assured the same access to facilities, scholarships and social support as boys. Rather, there is rising concern that girls, their families and communities do not have full access to the educational, social and health benefits that sports and physical activity can provide. Increasingly, the debate is not so much about equal gym time as it is about a healthy lifetime. Sport is about a great deal more than fun and games.

This report shows that physical activity and sport favorably influence girls' health and well-being in many ways. Getting more girls up and moving through exercise and sport, therefore, makes practical sense as a social and economic investment for the nation. Put simply, it makes sense to invest in girls' health and well-being now rather than paying high health costs later. This report discusses of a variety of health problems for which physical activity and sport have been identified as a preventive factor. In this context, consider the following estimated costs of failing to invest in exercise and sport:

- **Cardiovascular Disease:** The estimated direct and indirect costs of cardiovascular disease and stroke in the United States in 2003 are $351.8 billion (American Stroke Association, American Heart Association, 2003).

- **Cancer:** In the year 2002, the National Institutes of Health estimated the overall annual costs for cancer at $189.5 billion (National Institutes of Health, 2002).

- **Obesity-Related Diseases:** An increase in physical activity among children and adults would substantially reduce the $92.6 billion in U.S. healthcare expenditures that are spent on treating obesity-related diseases (Colditz, 1999).

- **Diabetes:** The 2002 national estimated cost of diabetes in the United States was $132 billion (Centers for Disease Control and Prevention, 2003).

- **Osteoporosis:** Regular exercise beginning in childhood and carried on through adolescence and young adulthood helps to prevent osteoporosis (Kannus, 1999).

- **Alzheimer's Disease:** The annual cost of caring for persons with Alzheimer's disease is estimated at $100 billion per year (National Institute on Aging, 2002).

- **Tobacco Use:** Estimates show that smoking caused over $150 billion in annual health-related economic losses from 1995 to 1999 (Centers for Disease Control and Prevention, 2002).

- **Alcohol Use:** The estimated annual cost of drug abuse to the U.S. economy in 1998 was $185 billion (Harwood, 2000).

- **Illicit Drug Use:** The estimated annual cost of drug abuse to the U.S. economy in 1998 was $143 billion, most of which was associated with drug-related crime (Office of National Drug Control Policy, 2001).

- **Sexually Transmitted Diseases:** Of the estimated 18.9 million Americans with new cases of STDs in 2000, about half (48%) were aged 15-24 (Weinstock, Berman and Wang, 2004), costing an estimated $6.5 billion overall. This estimate includes medical costs, productivity losses and intangible costs such as pain and suffering (Chesson et al, 2004.)

- **Teen Pregnancy:** One third (34%) of all U.S. adolescent girls get pregnant at least once before their 20th birthdays; of these 820,000 pregnancies annually, 80% are unintended. Nearly half a million result in a live birth. The associated costs, including health care, foster care, criminal justice, public assistance and lost tax revenues, are estimated at more than $7 billion annually (Henshaw, 2003; National Campaign to Prevent Teen Pregnancy, 2002).

- **Suicide:** The estimated annual costs associated with suicide are $15.5 billion in the United States (Miller et al, 1998).

This report is divided into six sections. Section I focuses on several major diseases of later life for which physical activity in youth are a key preventive factor. Section II examines how sports and exercise influence patterns of substance use among female adolescents. Section III explores ways that athletic participation lowers young women's sexual risks and teen pregnancy rates. Section IV discusses research on links between sports, exercise and educational outcomes. Section V focuses on research on the interfaces of sports and exercise with girls' mental health and psychological well-being. Finally, Section VI examines patterns and trends in female participation in sports and fitness activities.

I. Prevention of Chronic Diseases in Later Life

A growing body of research supports the important public health conclusion that a physically active lifestyle lowers risk for heart disease, certain cancers, obesity, osteoporosis and Alzheimer's disease. These diseases, which typically become chronic in middle age and among the elderly, are among the leading causes of death for women in the United States. The annual direct and indirect costs of sedentary lifestyles to chronic health conditions are reported to be $150 billion (Pratt, Macera and Wang, 2000). The facts and findings below testify to the promise a public health strategy that gets girls involved with sports and exercise when they are young in order to promote women's lifelong health.

Heart Disease

Background

Each year about one half million American women die from cardiovascular disease (CVD). The bulk of scientific research on CVD after World War II focused on white men and partly as a result, heart disease came to be falsely regarded as a "man's illness." During the 1990s, researchers identified numerous gender biases in the diagnosis and treatment of CVD. Compared with male counterparts, women's early symptoms of heart disease are more apt to go unheeded by physicians and once diagnosed, women may receive less vigorous medical attention. Today epidemiologists recognize that CVD kills more women in the United States than all cancers combined. Women of color are especially at risk for heart disease.

- CVD is the number-one cause of death among American women (44.6% of all deaths), and the death rate is 69% higher for black women than for white women (American Heart Association, 2003).
- Each year about 233,000 American women die from heart attacks and more than 87,000 die from strokes (Kendig and Sanford, 1998).
- Girls aged 4-19 have significantly higher bad cholesterol levels than do boys. LDL is a primary risk factor for heart disease (Centers for Disease Control and Prevention, 1995).
- Whereas 42% of women who experience a heart attack die within the first year after an incident, 24% of men do so (King and Mosca, 2000).
- Even though exercise is a proven and inexpensive therapy to reduce risk for heart disease, too many females lack the confidence and social support to implement a physically active lifestyle (Breslin and Lucas, 2003).

Facts and Research Findings

Research shows that physical activity throughout the lifespan helps to reduce girls' and women's risk for CVD. A physically active lifestyle in youth and early adulthood can help prevent the emergence of chronic illness later in life.

- Physical activity cuts the risk of developing heart disease. It also significantly lowers the risk of dying from CVD and stroke (Centers for Disease Control and Prevention Center, 1995; National Center for Chronic Disease Prevention and Health Promotion, 1996).
- Exercise can benefit women's heart health by lowering blood sugars and triglycerides (fats that travel in the bloodstream) and increasing HDL levels (the "good" cholesterol) (Haddock et al, 1998; Kendig and Sanford, 1998).
- Female patients in a cardiac rehabilitation program who combined strength training with aerobic exercise had significantly greater aerobic capacity than those who did not exercise (Nelson, 1998).

Cancer

Background

Cancer is a leading cause of death among women in the United States. Although the word "cancer" strikes fear into hearts and minds, experts assert that more than half of all cancers can be prevented by acting on existing knowledge (Harvard Report on Cancer Prevention, 1996, 1997; Colditz et al., 2002; Willett, 2003; Trichopoulos and Hunter, 1996). Researchers have begun to explore links between physical activity and cancers common among women (Harris, 2001), but not much is known about whether exercise is related to cervical, uterine or ovarian cancers. It still stands to reason that sports and exercise are indirectly related to lung cancer through reduction of smoking behavior since sports and fitness practices encourage girls not to start smoking or, among seasoned smokers, help them to quit. Exercise also appears to play a role in preventing breast cancer, which is diagnosed in one in every eight women across a lifetime (American Cancer Society, 2000).

- Breast cancer is the most common cancer among women, accounting for nearly one of every three cancers diagnosed in American women (Jemal et al, 2004).
- Smoking is responsible for 40% of all cancer deaths (Centers for Disease Control and Prevention, 2002).
- Compared with nonsmokers who do not live with a smoker, nonsmokers who live with a smoker have a 30% greater risk of dying of lung cancer (Williams, 2001).

Facts and Research Findings

Mounting evidence suggests that physically active women are less apt to get breast cancer. Because so many factors are involved, it is extremely difficult to unravel how cancer risks are influenced by the interconnections among physical activity, obesity and dietary practices. While some researchers have failed to find a preventive link (Dorgan et al, 1994; Paffenbarger et al, 1986), others have verified a lowering of risk (Frisch et al, 1985; Thune et al, 1997). Other investigators are exploring whether women's participation in programs that combine nutritional education and exercise may reduce risk for obesity-related cancers.

Researchers are also beginning to focus on the use of exercise to help cancer patients deal with fatigue, nausea, impaired nutrition, muscle loss and emotional challenges (Brown et al, 2003; Harris, 2001). Additional investigations focus on links between physical activity and life expectancy after diagnosis and treatment. These new lines of research are welcome information to the 9.5 million cancer survivors in the United States (Ries et al, 2003). About 62% of persons diagnosed with cancer live more than five years (Brown et al, 2003).

- One to three hours of exercise a week over a woman's reproductive lifetime (the teens to about age 40) may bring a 20-30% reduction in the risk of breast cancer, and four or more hours of exercise a week can reduce the risk almost 60% (Bernstein, 1994).
- Some studies show that female athletes on average experience menstrual onset later than their non-athletic peers. This may be important because one study found that the risk for breast cancer was reduced by 15% for every year that menarche was delayed (Bernstein, Ross and Henderson, 1992).
- Teenage female athletes are less likely to smoke than non-athletes, thus lowering their risk for many kinds of cancer (Miller et al, 2001).
- An estimated 90% of colon cancers could be prevented by taking an array of preventive steps including regular physical activity and avoiding midlife weight gain (Willett, 2003).
- Physical activity helps reduce risk for colon cancer (International Agency for Research on Cancer, 2002).
- Weight management, a healthy diet and regular physical activity can help to prevent about one-third of cancer cases (Willett, 2003).
- One study of women who exercised regularly found a 37% reduction of risk for breast cancer (Thune et al, 1997).

- Among postmenopausal women, those who reported being engaged in regular strenuous physical activity at age 35 year had a 14% decreased rate of breast cancer. For those who engaged in 1.25 to 2.5 hours of brisk walking per week, there was an 18% decreased risk of breast cancer (McTiernan et al, 2003).

- A cohort study of postmenopausal women in Iowa compared the obesity-related cancer rates of those who had intentionally lost 20 or more pounds with those who never reported an episode of intentional weight loss. The former women had significantly lower incidence rates than the latter; i.e., 11% lower for any cancer, 19% for breast cancer, 9% for colon cancer, 4% for endometrial cancer and 14% for all obesity-related cancer (Parker and Folsom, 2003).

- A sample of 72,608 cancer-free postmenopausal women who were followed for five years. The most physically active women had a 29% lower incidence rate of breast cancer than the least active women (Patel et al, 2003).

- Emerging research suggests that exercise elevates the quality of life and physical well-being of persons being treated for cancer (Courneya, 2003).

- "Exercise has been shown to improve cardiovascular fitness, muscle strength, body composition, fatigue, anxiety, depression, self-esteem, happiness and several components of quality of life (physical, functional and emotional) in cancer survivors" (Brown et al, 2003, p. 272).

Obesity and Being Overweight

Background

Obesity and being overweight have attained epidemic proportions in the United States, contributing to at least 300,000 deaths annually (Allison et al., 1999; U.S. Surgeon General, 2001). Amassing research evidence implicates obesity as a significant contributing factor to many illnesses (JAMA, 1999). Poor nutrition practices and declining physical activity are putting millions of girls at risk for obesity and its associated illnesses. The increasing number of obese and overweight children greatly concerns public health advocates, who predict higher rates of chronic and deadly diseases in later life.

- In 1970, only one out of every 21 girls was obese or overweight; today that figure is one in six (National Center for Health Statistics, 2002).

- There are nearly three times as many overweight adolescents today as in 1980 (U.S. Department of Health and Human Services, 2001)

- Black girls are twice as likely to be overweight as white girls (Centers for Disease Control and Prevention, 1999-2000).

- If current dietary and exercise patterns persist, the Centers for Disease Control and Prevention predicts that one in three U.S. children born in 2000 will become diabetic (Associated Press, 2003).

- Children who watch more television tend to exercise less, and poor children spend more time in front of televisions than their well-to-do counterparts (Anderson et al, 1998).

- Girls from lower socioeconomic households or girls who mature early are at particular risk for being overweight (Litt, 1997).

- A study of teenage students in Minnesota found that the more often they ate at fast food restaurants each week, the higher the percentage of fat in their average daily diet and the more soft drinks consumed. The fast food restaurant frequenters also ate less fruit, vegetables and milk (French et al, 2001).

- Sixty-two percent of American women are overweight or obese (National Center for Health Statistics, 2002).

- Overweight women are 60% more likely to die from breast cancer (Calle et al, 2003).

- Among women in their 20s with severe obesity, the decrease in life expectancy is eight years for whites and five years for African-Americans. For any degree of being overweight, younger adults risked losing more years of life than older adults (Fontaine et al, 2003).

- Obesity has been identified as a contributing factor to a host of diseases including diabetes mellitus type 2, coronary heart disease, stroke, diseases of the gallbladder, deep vein thrombosis, sleep apnea and liver disease (Abu-Abid and Klausner, 2002).

- Increasing evidence suggests that obesity is associated with recurrence in breast and other cancers (International Agency for Research on Cancer, 2002).

Facts and Research Findings

Healthy lifestyles for girls and women do not simply derive from individual choices and self-discipline. Being able to make healthful choices often requires educational advantages, having enough money to purchase the low-fat products and exercise equipment and the availability of accessible athletic and fitness facilities. Schools, churches and communities need to provide vehicles for children to engage in regular physical activity and to learn about healthy nutrition.

- Higher body mass index (a measure of body weight adjusted for height) predicted a decline in activity among both black and white girls (Kimm, 2002).

- Regular participation in physical activity during childhood and adolescence helps control weight, build lean muscle and reduce fat (U.S. Department of Health and Human Services, 1996).

- An increase in physical activity among children and adults would substantially reduce U.S. healthcare expenditures that are spent on treating obesity-related diseases (Colditz, 1999).

- Lack of physical activity and low levels of physical fitness are important contributing factors in the development and/or maintenance of obesity in African-American girls (Ward, 1997).

- A one-year weight control program designed for sedentary, overweight adult women documented significant weight loss and cardiorespiratory fitness gains for all levels of exercise (Jakicic et al 2003).

Osteoporosis

Background

Osteoporosis (the excessive loss of bone mass) is a disease that afflicts about 25 million Americans, 80% of whom are women (Lindsay, 1999; Darovic, 1997). Osteoporosis is a progressive and degenerative disease that begins in youth and most often develops fully in old age. Healthy nutrition, aerobic activity and weight-bearing exercise promote bone growth early in girls' lives, thereby helping to prevent osteoporosis later in life. This means that the number of Americans with osteoporosis is also likely to increase if young people become more sedentary and as the American population continues to age.

- By about age 20, the average woman has acquired 98% of her skeletal mass (Fishman, 2000). Building strong bones during childhood and adolescence can be the best defense against osteoporosis (National Osteoporosis Foundation, 2003).

- Of the 10 million Americans estimated to have osteoporosis, eight million are women. One in two women over age 50 will have an osteoporosis-related fracture in her lifetime (National Osteoporosis Foundation, 2003)

- Each year about 250,000 hip fractures occur among women in the United States and are associated with a 12% to 20% death rate within the first year following the event (Kendig and Sanford, 1998).

Researchers also caution that excessive exercise or training for a sport can induce amenorrhea, which, in turn, increases the risk for bone loss. Some studies show that female athletes with menstrual irregularities experienced a loss of bone density (Myburgh et al, 1993; Rencken, Drinkwater and Chesnut, 1993).

Facts and Research Findings

Exercise and athletic activity are generally believed to foster healthy bone growth among girls and women, particularly when a well-balanced diet that includes calcium, vitamin C and vitamin D is in the picture.

- Regular exercise beginning in childhood and carried on through adolescence and young adulthood helps to prevent osteoporosis (Kannus, 1999).
- High school sports participation may help prevent osteoporosis (loss of bone mass). Women who participated in high school sports have higher bone density than those who did not (Teegarden et al, 1996).
- Aerobic and weight-bearing exercise not only reduce young women's risk for osteoporosis later in life, but among older women already diagnosed, vigorous physical activity can erode further bone loss (Bonaiuti et al., 2002).
- A year-long study at Tufts University found that postmenopausal women who engaged in strength training gained 1% in bone density while women who did not exercise lost 2% of bone density (Nelson, 1998).

Alzheimer's Disease and Related Dementias

Background

Alzheimer's disease (AD) has emerged as a major public health challenge. AD is more prevalent among the elderly, and, as the American population becomes disproportionately older, the number of new cases is expected to grow. This disease produces devastating impacts on both families and the healthcare system. AD is a major women's health issue, as more women than men have the disease (mainly because women live longer than men) and more women function as informal caregivers to the afflicted (McCann et al 1997).

- About 4.5 million Americans now have AD (Hebert et al, 2003). If current trends persist, an estimated 14 million older Americans will have AD by 2050 (National Institutes of Health, 2002).
- AD afflicts about 10% of persons over 65, 20% of persons between 75 and 84 and 47% of persons over 85 (Cowley, 2000).
- AD mainly affects the oldest old in the United States, who are disproportionately women (Evans et al, 1989). It is also mostly women who provide informal care for persons with AD living in communities (McCann et al, 1997).
- The current cost of caring for people with AD is estimated to be $100 billion per year (Cowley, 2000).
- More than 70% of people with AD live at home, where they are being cared for by family and friends (Rice, 1993).

Facts and Research Findings

Many factors influence a person's risk for developing AD including genetics, nutrition and diet and cardiovascular illness. New research suggests that a physically active lifestyle in younger years reduces lifelong risk for AD. Preliminary research also shows that a physical activity may be related to positive health benefits for persons with AD as well as their caregivers.

- Higher levels of physical activity earlier in life may reduce risk for AD in later life (Pope, Shue and Beck, 2003; Smith and Friedland, 1998).
- Regular exercise can improve the physical function and emotional health of persons with moderate to severe AD (Teri et al, 2003; Arkin, 1999; Palleschi et al, 1996).
- Exercise programs may reduce problem behaviors among nursing home residents with AD such as aggression and wandering (Bonner and Cousins, 1996), as well as lowering nutritional and behavioral complications (Rolland et al, 2000).

II. Substance Use

Adolescent substance use remains common in the United States. Although overall youth substance use has decreased somewhat in recent decades, those children and adolescents who do use tobacco, alcohol and other drugs have been doing so at steadily younger ages. Traditionally, girls have tended to have lower rates of substance use than boys (particularly steroid use, smokeless tobacco and heavy drinking); however, the long-standing gender gap is narrowing (Amaro et al, 2001; Johnston, O'Malley and Bachman, 2003a; Substance Abuse and Mental Health Services Administration, 2002). Research suggests that the relationship between youth athletic participation and substance use is complex. Sports may be a potential alleviating factor against some kinds of drug use, but not others.

Tobacco Use

Background on Smoking

Despite the fact that cigarette smoking among American high school students has dropped to its lowest level in a decade, it remains the addictive behavior most likely to be established during adolescence and the leading cause of preventable, premature death in the United States (Evans, 1998). Smoking kills more Americans annually than all other drugs, homicides, suicides, motor vehicle accidents and fires, combined, with direct medical costs exceeding $50 billion annually. It is a primary risk factor in heart disease, lung disease and stroke in adults; environmental tobacco smoke also increases the likelihood of asthma and bronchitis in children. Nevertheless, adolescent smoking (particularly by white girls and boys) increased during the 1990s (U.S. Department of Health and Human Services, 2000). Some factors that influence girls to smoke include efforts at weight control, influence from peers and family, a strategy to manage negative mood states such as depression and image-related motivations (Wagner and Atkins, 2000; Glendinning and Inglis, 1999; Gerend et al, 1998).

- In grades 9-12, 29.5% of female students report current tobacco use (Centers for Disease Control and Prevention, 2002).
- More than 23% of ninth-grade girls reported using cigarettes within the past 30 days. This figure increased to 28.4% among 10th-grade girls. In addition, ninth-grade girls (23.9%) were significantly more likely than 11th- and 12th-grade girls (16.1% and 17.5%, respectively) to have smoked a whole cigarette before age 13 (Centers for Disease Control and Prevention, 2001, Table 26).
- Women and girls are particularly likely to smoke to control weight and negative moods (U.S. Department of Health and Human Services, 2001).
- Smoking is responsible for 30% of all cancer deaths (Centers for Disease Control and Prevention, 2002). It accounts for about 85-90% of all deaths from lung cancer, the leading cause of cancer mortality among women in the United States (U.S. Department of Health and Human Services, 2001).
- Some studies suggest that tobacco is a "gateway" drug. Cigarette smoking is a powerful predictor of other subsequent forms of substance use, including alcohol abuse and illicit drug use. High school students who smoke a pack of cigarettes a day are three times more likely to drink, seven times more likely to dip or chew tobacco and 10-30 times more likely to use illicit drugs than students who have never smoked (Torabi et al, 1993).

Facts and Research Findings

Research shows that athletic participation helps to reduce smoking among girls. Lower athlete smoking rates may be related to several factors, including greater self-confidence; counseling from coaches; less influence by smoking peers; and greater awareness of the potential health consequences of smoking, particularly where they directly impact athletic performance (Escobedo et al, 1993).

- Physical activity is associated with delayed onset of smoking; in one study, highly active girls were less than half as likely as less active girls to start smoking cigarettes (Aaron et al, 1995).

- One nationwide study in the early 1990s found that girls who participated on one or two school sports teams were significantly less likely than non-athlete girls to have ever tried cigarettes, ever smoked regularly or smoked cigarettes in the past month. Girls participating on three or more times were even less likely to have done so (Page et al, 1998).

- A later nationwide study also found that female athletes on one or two school or community sports teams were significantly less likely to smoke regularly than female non-athletes. Girls on three or more teams were even less likely to smoke regularly (Melnick et al, 2001).

- Females who participated on junior varsity and varsity sports teams were significantly less likely ever to have smoked than non-athletic girls (Zill et al, 1995).

- The more sports a high school student plays, the less likely she is to be a regular or heavy smoker. In one study, students who played at least one sport were 40% less likely to smoke regularly and 50% less likely to smoke heavily (Escobedo et al, 1993).

Background on Use of Smokeless Tobacco

Chewing and dipping tobacco are a major health risk. About 20% of boys in grades 9- 12 use these types of tobacco (Centers for Disease Control and Prevention, 1994), which puts them at greater risk for oral cancer, periodontal disease, tooth loss, leukoplakia and altered cardiovascular function (Hill, Harrell and McCormick, 1992; U.S. Department of Health and Human Services, 2000). Some girls may be picking up the habit as well.

- It is estimated that between 1.5% and 12% of female high school non-athletes have experimented with chewing and dipping tobacco and about 3% reported being regular users (Horn et al, 2000; Tomar and Giovino, 1998; Hu et al, 1996; Hill, Harrell and McCormick, 1992).

- In 2001, 1.4% of eighth-grade girls, 1.6% of 10th-grade girls and 1.6% of 12th-grade girls reported having used smokeless tobacco in the past month (Johnston, O'Malley and Bachman, 2002).

- About 824,000 young people aged 11-19 years experiment with chewing and dipping tobacco each year, and about 340,000 eventually become regular users (Tomar and Giovino, 1998).

Facts and Research Findings

Only a few researchers have studied the use of chewing and dipping tobacco among female athletes. While use among female athletes is lower than male athletes, it may be that females in certain sports are imitating their male counterparts by experimenting with chewing and dipping tobacco.

- Chewing and dipping tobacco use are high among male teenage athletes, but some use among female athletes is also evident (Hu et al, 1996; Tomar and Giovino, 1998).

- A study of a nationally representative sample of high school students found that 17% of male athletes and 2% of female athletes reported using chewing and dipping tobacco during the past month (Melnick et al, 2001).

- In one study of tobacco use by high school students, more than a third of all smokeless tobacco users were athletes who had participated on two or more sports teams in the past year (Rainey et al, 1996).

- An NCAA survey of female athletes found that overall chewing and tobacco use was about five percent. Higher rates were recorded for ice hockey players (22%), skiers (12%) and lacrosse players (12%) (NCAA, 1997).

- More than half of all female college athletes who use smokeless tobacco report that they first did so in high school or earlier (NCAA, 1997).

Alcohol Use

Background

For most U.S. adolescents and young adults, alcohol is the drug of choice. Nearly half of all eighth-graders, two thirds of 10th-graders, over 3/4 of high school seniors and 86% of college students have tried alcohol (Johnston, O'Malley and Bachman, 2003). Alcohol abuse is associated with all the leading causes of death among young people—accidents, homicides and suicides. It disrupts work, family and personal life by contributing to school failure, low worker productivity, unintended pregnancy, intimate violence and escalating healthcare costs. Drinking contributes to heart disease, cancer, liver disease and a host of other health problems, notably including fetal alcohol syndrome (U.S. Department of Health and Human Services, 2000). In fact, more than 100,000 deaths each year can be attributed to alcohol consumption (Pacific Institute for Research and Evaluation, 2002).

- The annual economic costs to the United States from alcohol abuse were estimated to be $184.6 billion in 1998, up from $167 billion in 1995 and $148 billion in 1992 (Harwood, 2000; U.S. Department of Health and Human Services, 2000).
- One in three Americans reports that alcohol has caused problems in her or his immediate family (Pacific Institute for Research and Evaluation, 2002).
- Alcohol has been identified as a "gateway drug;" that is, alcohol use tends to precede use of other illicit drugs (Merrill et al, 1994; O'Malley, Johnston and Bachman, 1998).
- About one in 10 eighth-grade girls, one in five 10th-grade girls, one in four 12th-grade girls and one in three female college students have binge drunk in the past two weeks (Johnston, O'Malley and Bachman, 2002; Johnston, O'Malley and Bachman, 2003).
- Seven percent of eighth-grade girls, 20% of 10th-grade girls and 29% of 12th-grade girls have been drunk in the past month (Johnston, O'Malley and Bachman, 2002).
- Girls tend to drink less than boys, but they are beginning to catch up; the gap has been decreasing for several decades (Johnston, O'Malley and Bachman, 2003).
- Adolescent girls who drink heavily are more likely than boys to report that they drink to escape problems, cope with frustration or anger or satisfy peer pressure (Donovan, 1996).

Facts and Research Findings

Research on the relationship between youth sports and drinking is mixed. Some studies find that high school or college female sports participation is associated with alcohol consumption (Aaron et al, 1995; Hildebrand, Johnson and Bogle, 2001; Leichliter et al, 1998; Nelson and Wechsler, 2001; Rainey et al, 1996; Thombs, 2000; Wechsler et al, 1997), while others do not (Baumert, Henderson and Thompson, 1998; Carr, Kennedy and Dimick, 1996; Higgs, McKelvie and Standing, 2001; Overman and Terry, 1991; Page et al, 1998; Pate et al, 2000). Several prominent theories have been advanced to explain athlete alcohol use, including the idea that athletes drink to self-medicate or reduce the stress of competition and injuries (Heyman, 1996; Leichliter et al, 1998; Miller et al, 2002), that the advertising industry reinforces the cultural tradition of drinking to celebrate a win or console a loss (Heyman, 1996; Holman et al, 1997; Madden and Grube, 1994; Slater et al, 1996) or that athletes are exposed to subcultures that are tolerant of, and exaggerate perceived norms of, drinking (Nelson and Wechsler, 2001; Thombs, 2000).

- Alcohol is the drug most widely used by college student-athletes. According to NCAA statistics collected in 1996, 80.5% of college student-athletes reported drinking in the past year (Green et al, 2001).

- Several nationwide studies have found that female college athletes binge drink more often, suffer more adverse consequences from drinking and consume more alcohol overall than female non-athletes (Leichliter et al, 1998; Nelson and Wechsler, 2001; Wechsler et al, 1997).

- High school athletes who participate on three or more sports teams are more likely to binge drink than non-athletes or less active athletes (Miller et al, 2000; Rainey et al, 1996).

- The link between sports and drinking may be stronger for male athletes than female athletes. Some studies find that male high school athletes drink more than their non-athletic male counterparts, but female high school athletes do not (Aaron et al, 1995; Carr, Kennedy and Dimick, 1996).

- Most studies do not reliably link female high school sports participation with elevated risk for problem drinking. Nationwide studies conducted in the 1990s found that female athletes and non-athletes did not differ in their odds of overall drinking, heavy drinking or binge drinking in the past month (Page et al, 1998; Pate et al, 2000).

- Other studies do find that female high school athletes are at risk for alcohol use. One study found that high school senior girls who had participated on 10th-grade junior varsity and varsity sports teams were 27% more likely to report binge drinking in the past two weeks than non-athlete girls (Zill et al, 1995).

Illicit Drug Use

Background

The societal costs of illicit drug use are difficult to calculate. Drugs such as marijuana, cocaine, amphetamines, barbiturates, hallucinogens, heroin, tranquilizers, inhalants, ecstasy and Rohypnol vary widely in the seriousness of their effects; but collectively, they are linked to a variety of negative economic, social and health consequences. For example, the estimated annual cost of drug abuse to the U.S. economy in 1998 was $143 billion, most of it associated with drug-related crime. Along with alcohol abuse, illicit drug use is associated with escalating healthcare costs; low worker productivity; homelessness; school failure; motor vehicle accidents; unintended pregnancies; and domestic violence (Office of National Drug Control Policy, 2001; U.S. Department of Health and Human Services, 2000).

- Well over half of all high school seniors (55%) have used an illicit drug at least once in their lifetimes; so have 32% of eighth-graders (Johnston, O'Malley and Bachman, 2003a).

- Thirty-eight percent of 12th-grade girls and 18% of eighth-grade girls have used an illicit drug at least once during the past year (Johnston, O'Malley and Bachman, 2002).

- Although most illicit drugs are uncommon among eighth graders, 19% have tried marijuana (8% in the past month), 15% have used inhalants (4% in the past month). Use of these and other "gateway drugs," such as alcohol and tobacco, put children at significant risk for eventual use of harder drugs (Johnston, O'Malley and Bachman, 2003b).

- Among high school seniors, boys are more likely to use drugs than girls; for example, 9% of boys but 3% of girls smoke marijuana daily. The gender differences are less pronounced at younger ages. At the eighth-grade level, boys are slightly more likely to use marijuana, whereas girls are slightly more likely to use inhalants, amphetamines or tranquilizers. (Johnston, O'Malley and Bachman, 2003b).

- Rates of female adolescent drug use tend to be lowest among blacks and Asian Americans, higher among whites and Latinas and highest among Native Americans (Wallace et al, 2003).

Facts and Research Findings

There are a variety of reasons why girls and women who participate in organized sports might be especially likely to seek out illicit drugs: to cope with competition-related stress, to self-medicate injuries or even just to satisfy sensation-seeking urges that led them to enjoy sports in the first place. On the other hand, there are also compelling reasons why they might be especially likely to avoid illicit drugs: to maintain the high level of physical fitness necessary for athletic participation, to conform to the conventional and pro-social norms of those around them or simply to avoid jeopardizing their eligibility to play. Research shows that whatever the motivation, female athletes tend toward the latter end of the spectrum: that is, they are less likely to use drugs than female non-athletes.

- According to one nationwide study conducted in the early 1990s, girls who participated on one or two school sports teams were significantly less likely ever to have used marijuana, cocaine or another illegal drug. Girls participating on three or more sports are even less likely to have used any of these substances (Page et al, 1998).

- Two more recent nationwide studies also found that female school or community athletes were significantly less likely to use marijuana, cocaine or most other illicit drugs, although they were no less likely to use crack or inhalants. This protective effect of sports was especially true for white girls (Miller et al, 2000; Pate et al, 2000).

- High school athletes are less likely to use cocaine or psychedelic drugs than non-athletes (Naylor, Gardner and Zaichkowsky, 2001).

- Female athletes are more likely than female non-athletes to wait until after high school to try marijuana for the first time (Ewing, 1998).

- High school athletic directors report the perception that student-athletes are less likely to smoke marijuana than their non-athlete peers (Shields, 1995).

- Athletes are at less risk for illicit drug use, but they are not immune. According to NCAA statistics collected in 1996, 28.5% of college students who are not athletes had used marijuana in the past year (Green et al, 2001).

Anabolic-Androgenic Steroid Use

Although conventional wisdom has typically associated anabolic-androgenic steroid use with organized sports, research suggests that many girls and young women may be motivated to use steroids for other reasons—most importantly, in order to look fit and attractive. A physically active lifestyle, which accomplishes the same purpose, may actually serve as a protective mechanism against the use of steroids. In combination with accurate knowledge about the potential consequences of steroid use, sports and exercise programs may be a potential weapon in the public health arsenal.

Background

Anabolic-androgenic steroid use as a means of enhancing physical appearance or athletic performance has been condemned by the American Academy of Pediatrics, the American College of Sports Medicine and the National Institute on Drug Abuse. Nevertheless, approximately 2.5% of female adolescents in the United States have used steroids at least once without a doctor's prescription. By the mid-1990s, an estimated 175,000 high school girls had done so at least once in their lives and the number continues to grow. The public health implications of this trend are dismaying, because girls and young women who use steroids face a dizzying array of negative physical and psychological consequences. Research on steroid use by girls and female adolescents is sparse, but some facts stand out:

- Potential health hazards faced by steroid users in general include cardiovascular disease, impaired liver function, elevated blood pressure and cholesterol, acne, mood swings and increased aggression (American College of Sports Medicine, 1987; Pope and Katz, 1994).

- Female users in particular are susceptible to a range of additional side effects, such as hirsutism (growth of facial hair), deepened voice, male pattern baldness, clitoral enlargement and reproductive abnormalities. Most of these side effects are irreversible once they occur (National Institute on Drug Abuse, 1994; Strauss, Liggett and Lanese, 1985).

- Children and adolescents are additionally vulnerable to premature skeletal maturation, leading to permanently stunted growth (Committee on Sports Medicine and Fitness, 1997).

- Adolescent steroid use has grown over the past decade, particularly among high school seniors; this increase has been accompanied by a corresponding drop in the proportion of teens who perceive "great risk" in using steroids (Johnston, O'Malley and Bachman, 2003).

- Although boys are still at least twice as likely to use steroids as girls, female adolescents are a quickly growing population of steroid users (Bahrke et al, 2000; Elliot and Goldberg, 2000; Yesalis et al, 1997).

Facts and Research Findings

Conventional wisdom suggests that steroid use is generally oriented toward maximizing performance in strength-oriented sports. Research does indeed show that athletes (and male adolescent athletes in particular) are disproportionately likely to use performance-enhancing drugs. While athletes are an at-risk population, adolescent steroid use is probably better understood as part of a problem behavior syndrome; that is, users are significantly more likely than their steroid-free peers to engage in other health-risk behaviors (Jessor and Jessor, 1977; Middleman et al, 1995; Miller et al, 2002b; Wichstrom and Pedersen, 2001)

- Most but by no means all adolescent steroid users are athletes (Committee on Sports Medicine and Fitness, 1997; Gaa et al, 1994; Salva and Bacon, 1991).

- Athletes and non-athletes tend to use steroids for different reasons. Athletes are likely to be motivated by a desire to improve athletic performance; non-athletes are more likely to be motivated by a desire to improve their physical appearance (Scott, Wagner and Barlow, 1996).

- Steroid users are more likely to use tobacco, alcohol and other illicit drugs, whether they participate in sports or not (DuRant et al, 1995; Meilman et al, 1995; Radakovitch, Broderick and Pickell, 1993). Athlete steroid users report less illicit drug use than non-athlete steroid users (Miller et al, 2002a).

- Steroid users are more likely to engage in aggressive or violent behavior, whether they participate in sports or not (Pope and Katz, 1994; Strauss, Liggett and Lanese, 1985; Su et al, 1993).

- Steroid users are more likely to be suicidal, whether they participate in sports or not (Middleman et al, 1995; Minelli, Rapaport and Kaiser, 1992). Athlete steroid users are less likely to think about or attempt suicide than non-athlete steroid users (Miller et al, 2002a).

- Steroid users are more likely to be sexually active and take more sexual risks, whether they participate in sports or not (Middleman et al, 1995; Miller et al, 2002b). Athlete steroid users take fewer sexual risks than non-athlete steroid users (Miller et al, 2002a).

- Steroid users are more likely to suffer from poor body image and/or disordered eating, whether they participate in sports or not (Pope and Katz, 1994; Gruber and Pope, 2000; Thompson and Sherman, 1999; Wichstrom and Pedersen, 2001). However, preoccupation with physique can be the link between sports and steroid use (Elliot and Goldberg, 2000; Irving et al, 2002).

- Education can be an effective tool in reducing steroid use, but only when it is balanced. Failure to acknowledge potential benefits (such as muscle development and enhanced strength) reduces the credibility of steroid education programs and can actually backfire, increasing the likelihood of steroid use (National Institute on Drug Abuse, 2000).

III. Sexual and Reproductive Health

Sexual Risk Prevention

Background

Risky sexual behavior continues to be a significant danger to U.S. girls and women. Sexual risk-taking encompasses a wide range of behaviors, such as sexual precocity (early initiation of sexual intercourse), promiscuity (multiple partners, either sequentially or concurrently), casual sex (with an unfamiliar partner), unprotected sex (not using contraceptives or prophylactics), having sex with high-risk partners and sexual activity influenced by substance use (Erkut and Tracy, 2000). Risk-taking may or may not be a deliberate and voluntary choice; either way, it is often accompanied by serious negative consequences, including but not limited to sexual assault, unintended and/or unwanted pregnancy and infection with sexually transmitted diseases (STDs). Women are at higher risk than men for all of these consequences—even some STDs, to which they are biologically more susceptible (Misra, 2001).

- In 1970, only 29% of girls aged 15-19 had had sex; the proportion increased to 55% in 1990 and then declined to 49% by 1995 and 43% by 2001 (Abma and Sonenstein, 2001; Flanigan, 2001; Grunbaum et al, 2002).
- Eleven percent of currently sexually active high school girls have had sex with four or more partners; during their most recent sexual encounter, 21% used alcohol or drugs and 49% did not use a condom (Grunbaum et al, 2002).
- Substantial numbers of young adults aged 18-24 report that on at least one occasion, alcohol or drugs have influenced their decisions about sexual behavior (37%), led them to do more sexually than they had planned (30%) or led them to have unprotected sex (24%) (Hoff, Green and Davis, 2003).
- Nearly two thirds of young people aged 15-24 report that they have had sex without a condom at least once (Hoff, Green and Davis, 2003).
- More than half of girls aged 12-17 say that one of the main reasons teens don't use birth control is that their partners don't want them to (National Campaign to Prevent Teen Pregnancy, 2000).
- About one in four sexually active adolescents is infected with an STD each year (Kirby, 2001).
- Young women are at higher risk for contracting STDs than older women, because they are more likely to have unprotected sex or sex with multiple and/or high-risk partners (Misra, 2001).

Facts and Research Findings

Recent research suggests that female athletic participation tends to buffer girls and young women against a variety of sexual risk behaviors, such as early sexual onset, multiple sex partners, unprotected sex and sex under the influence of drugs or alcohol.

- Athletic participation reduces sexual risk. Girls who play sports start having sex at a later age, have sex less often and have sex with fewer partners; they may also be less likely to use alcohol or drugs before sex, have unprotected sex or get pregnant (Erkut and Tracy, 2000; Miller et al, 1998; Miller et al, 1999; Miller et al, 2002; Pate et al, 2000; Sabo et al, 1998).
- Physical activity reduces sexual risk. Girls who exercise strenuously are less likely to begin having sex before age 15, use alcohol or drugs before sexual intercourse, have unprotected sex, have multiple sex partners or get pregnant (Brown et al, 1997; Miller et al, 2002).
- The relationship between sports and sexual risk is influenced by both race and class. Both urban and African-American female athletes are less likely to have sex while under the influence of drugs or alcohol. However, among girls living in poor neighborhoods, athletes are less likely to be sexually active but actually more likely to have unprotected sex (Erkut and Tracy, 2000).

- Female athletes are less likely to be sexually active, in part because they tend to be more concerned about getting pregnant than female non-athletes (Dodge and Jaccard, 2002).

- Adolescent sports participation is associated with reduced sexual risk-taking later on. Young adult women with a history of high school athletic participation report fewer sex partners and are less likely to get pregnant outside marriage, although they are no more likely than non-athletes to report consistent condom use (Eitle and Eitle, 2002).

- Female college student-athletes enjoy lower overall risk of HIV and other STDs than their non-athlete peers. According to one study, female college athletes (21%) are less likely than non-athletes (36%) to have ever engaged in health-compromising behavior (including sex) as a result of substance use. Among sexually active college women, athletes (60%) are significantly less likely than non-athletes (86%) to have ever had sex without a condom (Kokotailo et al, 1998).

- High-performance female adolescent athletes (training at least 11 hours/week and competing at the regional, state or national level) are less likely than non-athletes to have had sex, had sex before age 15 or had more than one sex partner; sexually active athletes were more likely than non-athletes to have used a condom the last time they had sex (Savage and Holcomb, 1999).

- However, high-performance athletes (29%) are also more likely than adolescent girls in general (10%) to report having contracted an STD. This puzzling difference might be a result of greater physical self-awareness or more accurate reporting by athletes (Savage and Holcomb, 1999).

Teen Pregnancy Prevention

Background

The United States has the highest teen pregnancy and birth rates in the industrialized world. One third (34%) of all U.S. adolescent girls get pregnant at least once before their 20th birthdays; of these 820,000 pregnancies annually, 80% are unintended. Nearly half a million result in a live birth. The associated costs, including healthcare, foster care, criminal justice, public assistance and lost tax revenues, are estimated at more than $7 billion annually (Henshaw, 2003; National Campaign to Prevent Teen Pregnancy, 2002).

There is good news, however. Adolescent pregnancy rates in the United States have fallen to their lowest level in two decades. The teen birth rate gradually declined throughout the 1990s, across white, black, Hispanic, Native American and Asian-American categories. The rate for 15- to 19-year-olds alone declined by about 30% between 1991 and 2002 (Martin et al, 2003; National Campaign to Prevent Teen Pregnancy, 2002).

- Three out of four adolescents use some form of contraception the first time they have sexual intercourse. Unfortunately, only about two-thirds of girls who use contraceptives do so consistently, every time (Terry and Manlove, 2000).

- Strong attachment to school reduces the risk of school-age pregnancy or birth for white, black and Latina girls. However, only one-third of adolescent mothers graduate from high school; fewer than 2% graduate from college by age 30 (Manlove, 1999; National Campaign to Prevent Teen Pregnancy, 2004).

- Children of adolescent mothers are at higher risk for low birth weight and other complications of premature birth, such as poor school performance, abuse and neglect (National Campaign to Prevent Teen Pregnancy, 2002).

- According to the 2001 Youth Risk Behavior Survey, 12% of black girls, 6% of Latinas and 4% of white girls had experienced a pregnancy at some point (Grunbaum et al, 2002).

- According to one comprehensive national study (Add Health), 12% of sexually experienced girls in grades 7-8 and 19% of sexually experienced girls in grades 9-12 reported having been pregnant at some point (Blum and Rinehart, 1998).

- Declining pregnancy rates have resulted in part from lower levels of adolescent sexual activity. However, most of the reduction in pregnancy rates is attributable to more frequent, consistent and effective contraceptive use, including new long-acting methods such as implants (e.g., Norplant) and injectables (e.g., Depo-Provera) (Darroch and Singh, 1999; Flanigan, 2001; NYS Council on Children and Families, 2001).

Facts and Research Findings

Organized sports represent a largely untapped resource for protecting adolescent girls against the risk of an unintended pregnancy. Most studies find that athletic participation reduces odds of teen pregnancy, through such mechanisms as reducing sexual activity overall and increasing the likelihood of consistent and effective contraceptive use. The reasons for this link remain unclear, however. Researchers have speculated that female athletes are specially advantaged by access to coaches, athlete peers and health professionals who can serve as counselors and sources of information about pregnancy prevention. Girls who participate in sports also tend to enjoy higher self-esteem and greater popularity, making them less susceptible to pressures to have unwanted or unprotected sex. In addition, female athletes may be less committed to the traditional, passive image of femininity and thus more inclined to see themselves in terms of their own accomplishments, rather than their appeal to boys (Melnick and Sabo, 1997; Miller et al, 1999).

- Female high school athletes have lower odds of teen pregnancy than their non-athlete peers (Dodge and Jaccard, 2002; Miller et al, 1999; Page et al, 1998; Rome, Rybicki and Durant, 1998; Sabo et al, 1998).

- The protective effect of sports participation applies across racial and ethnic categories. Reduced pregnancy rates for athletes were found for white, African American and Latina girls in a nationwide sample (Sabo et al, 1998).

- The protective effect of sports participation applies to actual birth rates as well as pregnancy rates. Tenth-grade female varsity athletes are about a third less likely than female non-athletes to become a teen parent by their senior year (Zill, Nord and Loomis, 1995).

- The protective effect of sports participation applies at the college level, too. According to one study of sexually active female college students, athletes (1%) were less likely than non-athletes (11%) to report ever having been pregnant (Kokotailo et al, 1998).

- The protective effect of sports participation is not merely the result of keeping girls busy; research indicates that female athletes are less likely than non-athletes to get pregnant, but other extracurricular activities (e.g., drama or music) do not have the same impact (Sabo et al, 1999).

- The difference between athlete and non-athlete pregnancy rates may be partly explained by the fact that athletes tend to be younger, better educated and more likely to be white than their non-athlete peers—all factors that reduce pregnancy risk (Dodge and Jaccard, 2002).

IV. Mental Health and Well-Being

Sports and exercise have become a developmental presence in the lives of millions of American girls. Physically active people generally tend to have better mental and emotional health. Physical activity can prevent the emergence of certain mental illnesses as well as helping those who suffer from various mental illnesses to cope or regain emotional stability. The review below discusses some of the contributions of physical activity and sport to the psychological well-being of girls and women.

Depression

Background

Depression is a treatable mental illness related to biochemical imbalances in the brain. Its symptoms may include feelings of sadness, hopelessness and worthlessness, loss of ability to experience pleasure, loss of interest in activities one usually enjoys, difficulty concentrating and changes in sleep, appetite, weight and energy levels. Depression affects an estimated 12 million American women each year; as many as 20% of women have at least one clinically diagnosable episode at some point in their lives. In fact, according to some estimates, depression is the leading cause of disability worldwide among women today (Mazure, Keita and Blehar, 2002; National Institute of Mental Health, 1999; National Institute of Mental Health, 2000).

Adolescents are especially vulnerable and there is evidence that children born since World War II have higher rates of depressive disorders, become depressed at an earlier age and are more likely to commit suicide than were adolescents of earlier generations (Gore, Aseltine and Colton 1992; Murphy and Wetzel 1980; Klerman and Weissman 1989).

- Depression affects twice as many women as men. Biology, environment and psychology all play a role in these higher rates (Bhatia, 1999; National Institute of Mental Health, 2000).
- Adolescent girls are particularly at risk. Although depression rates are comparable for girls and boys prior to puberty, by age 15, girls are twice as likely as boys to have experienced a major depressive episode. This gender gap continues for the next 35 to 40 years, until menopause (Cyranowski et al, 2000).
- Reasons for gender differences in adolescent depression rates include changes in body shape and the way our culture hypersexualizes girls, the increase in hormones associated with puberty and peer pressure to conform to stereotypical gender norms (University of Michigan Depression Center, 2002).
- Before graduating from high school, nearly one out of three adolescent girls will experience depression, anxiety disorders or eating disorders, a rate approximately twice the rate for boys (The Commonwealth Fund, 1997a).
- Girls are significantly more likely than boys to have seriously considered attempting suicide, made a plan to attempt suicide and attempted suicide (Centers for Disease Control and Prevention, 2002).
- There are many misconceptions about depression. According to a National Mental Health Association survey, most women believe that it is "normal" for a woman to be depressed after giving birth, during menopause and in old age, and therefore treatment is unnecessary (National Mental Health Association, 2000).

Facts and Research Findings

Physical exercise is often viewed as an antidepressant; it can elevate mood, create a sense of well-being and reduce depressive symptoms. A variety of studies have found that higher levels of physical activity were related to lower rates of depression (Farmer et al, 1988; Hassmen, Koivula andUutela, 2000; Stephans, 1988; Taylor et al, 2004). The evidence for exercise as an effective treatment for clinical depression remains limited, however, because most studies have been done on non-clinical volunteers and/or have looked at short-term impacts only (Craft et al, 1998; Mazure, Keita and Blehar, 2002). Less attention has been devoted to the impact of athletic participation on depression, although findings thus far are promising.

The growing documentation of the link between physical activity and depression (Brugman and Ferguson, 2002; Miser, 2000) lends credence to public health strategies that young women become active.

- According to a recent comprehensive review of existing research, both resistance training and aerobic exercise can reduce symptoms of depression. Both moderate and vigorous exercise can have this effect (Dunn, Trivedi and O'Neal, 2001).
- Regular exercise is as effective a treatment for depression as are antidepressants in some cases (Dimeo, 2001).
- Women and girls who participate in regular exercise suffer lower rates of depression (Page and Tucker, 1994; Nicoloff, and Schwenk, 1995)
- Regular exercise is related to self-esteem. Low self-esteem is often an underlying factor in depression (Artal and Sherman, 1998).
- Both swimming and body building can significantly reduce depression levels in women (Ahmadi et al, 2002).
- Moderate (3-6 hours/week) levels of sports activity are associated with lower levels of adolescent depression than low (0-2 hours/week) levels of involvement (Sanders et al, 2000).
- Compared with those who exercised at least 30 minutes, five or more days per week, sedentary individuals were 1.31 times more likely to experience mental distress, 1.34 times more likely to have anxiety symptoms and 1.22 times more likely to have depressive symptoms (Taylor et al, 2004).
- A sample of women and men with depressive symptoms who began walking daily experienced a decline in symptoms (Mobily et al, 1996).
- Sports involvement does not protect against depressed mood in adolescents overall. However, among low-achieving (low GPA) high school girls, team sports involvement protects against depressed mood (Gore, Farrell and Gordon, 2001).
- High school athletes are significantly less likely to report feelings of hopelessness than non-athletes (Baumert, Henderson and Thompson, 1998).

Suicide

Background

Suicide is the third leading cause of death among U.S. teenagers, after accidents and homicide. Adolescents are less likely to succeed in killing themselves than adults of any age, but far more likely to think about or attempt suicide. About 14% of all suicides are committed by people under the age of 25 (American Association of Suicidology, 2003). However, youth suicidality comes at an appalling price. The financial cost of adolescent and pre-adolescent suicides, including medical expenses, loss of future earnings and damage to the quality of life of the victims' families, has been estimated at more than $15.5 billion a year (Miller, Covington and Jensen, 1999). The personal and social cost, in terms of the potential it curtails, is incalculable.

- According to the National Household Survey on Drug Abuse, almost 3 million youths aged 12-17 were at serious risk for suicide in 2000 (Substance Abuse and Mental Health Services Administration, 2001).
- About eight of every 100,000 adolescents aged 15-19 commit suicide (National Institute of Mental Health, 2003).
- Women are three times as likely to attempt suicide as men, but men are four times as likely to succeed (Canetto, 1997; Moscicki, 1994; National Institute of Mental Health, 2003). Among adolescents and young adults, the suicide ratio is higher: 5:1 among 15- to 19-year-olds and 6:1 among 20- to 24-year-olds (American Association of Suicidology, 2003).

- Youth suicide rates increased more than 200% from the 1950s to the late 1970s; since then, they have largely stabilized. Female adolescent suicide rates have stayed relatively constant since 1980 (American Association of Suicidology, 2003; Centers for Disease Control and Prevention, 2004; National Adolescent Health Information Center, 2000).

- Approximately one out of every 100 to 200 youth suicide attempts is successful (Arias et al, 2003). In a typical U.S. high school classroom, it is likely that one girl and two boys have attempted suicide in the past year (American Association of Suicidology, 2003).

- In 2001, 23.6% of U.S. high school girls seriously considered suicide, representing a significant decrease over the course of the 1990s (37.2% in 1991). However, the proportion that actually attempted suicide (11%) or were injured in a suicide attempt (3%) stayed about the same (National Center for Health Statistics, 2003).

- Suicidal ideation in college students is linked to other risky behaviors, such as substance use, drunk driving, seat belt nonuse, fighting and carrying a weapon (Barrios et al, 2000; Brener et al, 1995).

- Suicidal ideation and attempts in high school students are associated with other risky behaviors, including substance use (tobacco, marijuana, cocaine, other illegal drugs) and sexual risk-taking (Burge et al, 1995; Choquet, Kovess and Poutignat, 1993; Windle, Miller-Tutzauer and Domenico, 1992).

- Among female adolescents specifically, suicidality is part of a larger problem behavior syndrome (Jessor and Jessor, 1977); suicidal ideation and attempts are associated with school misconduct, smoking, problem drinking, over-the-counter drug use, vehicular risk, substance use before most recent sexual activity, depression and violence (Vannatta, 1996; Windle and Windle, 1997; Woods et al, 1997).

- According to the National Household Survey on Drug Abuse, adolescents who used alcohol or illicit drugs during the past year were at greater suicide risk, including 20% of drinkers vs. 9% of nondrinkers; 25% of marijuana users vs. 9% of nonusers; and 29% of other drug users vs. 10% of nonusers (Substance Abuse and Mental Health Services Administration, 2001).

Facts and Research Findings

With a few exceptions (e.g., Baumert, Henderson and Thompson, 1998; Choquet, Kovess and Poutignat, 1993), most studies have found that involvement with sports helps to protect against suicidality. Research shows that athletic participation may provide girls and young women with a powerful buffer against suicidal thoughts and actions (Brown and Blanton, 2002; Ferron et al, 1999; Oler et al, 1994; Page et al, 1998; Sabo et al, 2004; Tomori and Zalar, 2000; Unger, 1997).

- Female college students who are not athletes are two-thirds more likely to report suicidal behavior than female college student-athletes (Brown and Blanton, 2002).

- Swiss adolescents (aged 15-20) who participate in sports regularly have lower odds of attempting suicide (Ferron et al, 1999)

- American female high school athletes are significantly less likely to report depression, suicidal ideation or attempted suicide (Oler et al, 1994).

- Female suicide attempts are linked to the attitude that sport is not important for health and to noninvolvement in sport as a coping style in distress (Tomori and Zalar, 2000).

- Female high school athletes, especially those participating on three or more teams, have lower odds of considering or planning a suicide attempt (Sabo et al, 2004).

- Female high school athletes on one or two sports teams are less likely to have attempted suicide in the past year than female non-athletes (Page et al, 1998).

- In contrast to sports, physical exercise may actually be associated with increased suicide risk; college women who engage in moderate or frequent vigorous physical activity are nearly twice as likely to report suicidal

behavior (Brown and Blanton, 2002), and high school girls who engage in frequent physical activity report higher rates of suicidal behavior (Unger, 1997) than those who are inactive. One possibility is that this exercise is aimed at weight loss, and is thus related to poor body image, low self-esteem and depression.

Body Image

Background

American girls are deluged with advertisements promising self-improvement almost from birth. Beauty and the importance of one's physical appearance are some of the most aggressively marketed values. It often appears there is no escape from images of physical perfection, and that "perfection" is always presented as thin (Wiseman et al, 1992). Most research in this area focuses on women not being able to live up to computer-generated ideals (Kilbourne, 1994; Bordo, 1993; Botta, 1999; Grogan, Williams and Connor, 1996; Cash and Brown, 1989; Turner et al, 1997). But body image is also linked to race, ethnicity, sexuality and power—issues that are often overlooked when discussing the problem (Duke, 2000; Edut, 2003). There are racial and cultural issues that have an impact (Desmond et al, 1989).

Theories of mass media argue that audience members internalize and try to emulate the ideal images presented to them, especially when exposed to repeated, long-term viewing (Harrison and Cantor, 1997; Cusumano and Thompson, 1997; Martin and Gentry, 1997; Myers and Biocca, 1992). In this context, developing and nurturing a positive body image for girls is difficult at best. Girls are more likely than boys to have a negative body image, although this problem is on the rise for boys (Pope, Phillips and Olivardia, 2000, Bordo, 1999). Negative body image often leads to disordered eating (Levin and Smolak, 1997; Stice and Shaw, 1994) and destructive weight loss behaviors (Paxton et al, 1991). Participation in sport and physical exercise has been shown to have positive impacts on body image, but for girls, participation declines at the point of adolescence.

A Harvard Medical School survey of fifth- to 12th-grade girls showed that 59% of the sample expressed dissatisfaction with their bodies, 66% wanted to lose weight, 47% said looking at pictures in fashion magazines made them want to lose weight and 69% claimed those pictures influenced what they considered to be their ideal body (Field et al, 1999).

- Girls and boys with negative body images may turn to risky behaviors like smoking to help them lose weight (Marcus, 1999).
- A 2003 study showed that overvaluation of thinness is a predictive factor for entry into smoking and that negative body image and self-esteem leads is the source of overvaluation (Gardner, 2003).
- Fewer than 60% of women engage in physical activity on a regular basis (National Women's Health Information Center, 2001).
- Forty-two percent of girls in grades 1 to 3 want to be thinner (Collins, 1991).
- Fifty-one percent of 9- and 10-year-old girls feel better about themselves if they are on a diet (Mellin, 1991).
- At age 13, 53% of American girls are "unhappy with their bodies." This grows to 78% by the time girls reach 17 (Brumberg, 1997).
- More than 90% of people with eating disorders are women (American Osteopathic Association, 2003).

Facts and Research Findings

Exercise has been shown to have positive impacts on body image. Many researchers agree that it can be used as both a preventative measure and a form of successful treatment for body image disorders. Concerns about body image are widespread among younger women (Richards, 2003) and exercise is potentially an effective remedy for that problem, both for the feelings of competence it provides and for its physical effect on metabolism.

- Exercise has a positive effect on body image (Gauvin and Spence, 1996; Boyd and Hrycaiko 1997; Fox, 2000).
- Individuals already high in self-esteem are more likely to exercise (Gauvin and Spence, 1996), so the challenge is to find ways to engage groups lower in self-esteem to exercise (Frank and Gustafson, 2001).
- Teenage female athletes are more likely to have positive body images than female non-athletes (Women's Sports Foundation, 2001; President's Council on Physical Fitness and Sports, 1997; Colton, 1991; Women's Sports Foundation, 1985).
- Exercise and sport participation can be used as a therapeutic and preventive intervention for enhancing the physical and mental health of adolescent females. It also can enhance mental health by offering them positive feelings about body image, improved self-esteem, tangible experiences of competency and success and increased self-confidence (President's Council on Physical Fitness and Sports, 1997).

Self-Esteem

Background

One of the most researched areas in developmental psychology is gender differences in self-esteem during adolescence. Self-esteem generally is a global self-concept that reflects the degree to which an individual feels positive about herself. Self-esteem has to do with self-perceptions about worth, goodness and competence (Tafarodi and Milne, 2002). Self-esteem rises when a person succeeds, is praised or experiences another's love. Self-esteem is lowered by failure, criticism, rejection and negative outcomes (Leary, 1999). Some researchers point out that there are different kinds of self-esteem (e.g., physical, social, academic or artistic) and the term "global self-esteem" is sometimes used to refer to an individual's general positive or negative attitude toward the self (Rosenberg, 1995).

Female adolescents are likely to experience a decrease in self-esteem during the teenage years, although the reasons are complex and mediated by many factors such as age and stressful life events (Baldwin and Hoffman, 2002; Block and Robins, 1993; Chubb, Ferman and Ross, 1997; Quatman and Watson, 2001; Zimmerman et al, 1997). Low self-esteem has been said to contribute to depression, anxiety, substance abuse, interpersonal problems and deviant behavior (Robson, 1988). Individuals with high self-esteem are said to be more assertive, willing to take risks, happy with themselves, supportive of others, independent and more open to personal growth.

- The decline in female self-esteem is partly linked to perceived attractiveness and self-worth and the fact that society's ideal of physical beauty for women is nearly impossible to attain (Marzano-Parisoli, 2001; Wade and Cooper, 1999).
- Many girls have low self-esteem because they have negative perceptions of weight, body fat and body mass (Dunton, Jamner and Cooper, 2003).

Facts and Research Findings

Exercise and physical activity are generally believed to favorably influence girls' physical self-esteem and, to a lesser extent, global self-esteem (Fox, 1988, 2000; Guinn, Semper and Jorgensen, 1997; Palmer, 1995; Sonstroem, 1984, 1997). One review of the research in this area concluded that exercise and physical activity can have positive impacts on female physical and global self-esteem although the benefits are greatest for children, middle-age adults and those with initially lower self-esteem (Fox 2000). However, other researchers have not found an association between participating in exercise programs and increased self-esteem (Boyd and Hrycaiko, 1997; Tiggemann and Williamson, 2000). One limitation with the existing research is that there are not many randomized, carefully controlled research studies that do a better job at isolating the influence of exercise itself. Another problem is that factors other than exercise can markedly influence self-esteem, such as family dysfunction or poverty. Race and ethnicity can also shape young women's self-esteem (Malloy and Herzberger, 1998; Twenge and Crocker, 2002)

Studies of the influence of athletic participation on physical and global self-esteem have the same limitations as the research on exercise. The findings are mixed, and they suggest that sport is best viewed as one element amid a spectrum of psychosocial factors that influence girls' global self-esteem.

- Female sports participation was found to promote self-worth, but only if it fostered physical competence, a favorable body image and gender flexibility (Richman and Shaffer, 2000).
- Female college basketball, volleyball and softball players scored significantly higher on body esteem measures than female non-athletes (DiNucci et al, 1994).
- A study of 12- to 14-year-old and 16- to18-year-old girls who participated in a 10-week field hockey and track and field skills program measured a significant increase in self-esteem (Salokun, 1984).
- Sports participation was associated with less risk for body dissatisfaction and disordered eating and lower global self-esteem among adolescent girls (Tiggemann, 2001).
- School sports positively impacted Caucasian girls' global self-esteem to the extent that it increased their attachment to school and sense of physical well-being (Tracy and Erkut, 2002).
- It is difficult to try to predict the effects of sports participation on the self-esteem of African-American girls because it probably derived from other sources (Tracy and Erkut, 2002).
- Compared with a control group, sixth- and seventh-grade girls who participated in an eight-month physical challenges program scored higher on measures of global self-esteem, athletic competence, physical appearance and social acceptance (Ebbeck and Gibbons, 1998).
- Participating in rock climbing increased self-esteem only so far as the participants perceived themselves to be competent in the sport (Iso-Ahola, LaVerde and Graefe, 1988).

Pathogenic Weight Loss Behavior

Background

Eating disorders are on the rise in the United States and the highest risk category is adolescent and young adult women (Taub and Blinde, 1992). Over 90% of victims are female, and 86% report onset by age 20 (National Association of Anorexia Nervosa and Associated Disorders, 2004). About 1% of adolescent girls suffer from anorexia nervosa, a condition in which a distorted body image and an intense fear of gaining weight lead to voluntary starvation. Bulimia nervosa, a pattern of binge eating and purging, affects 1-3% of adolescent girls (Hausenblas and Carron, 1999). However, a far higher proportion of girls do not meet the formal criteria for a clinical eating disorder but nevertheless engage in pathogenic weight control techniques, including self-induced vomiting, fasting, use of laxatives, diuretics or diet pills and excessive exercise (Thompson and Sherman, 1999). Pathogenic weight loss behavior is associated with nutritional deficiencies, chronic fatigue, decreased bone density, erosion of tooth enamel, menstrual and reproductive abnormalities, lowered self-esteem, anxiety and depression (Beals, Brey and Gonyou, 1999).

- On any given day in the United States, 56% of women are on diets (Pipher, 1995). Forty percent of 9- and 10-year-old girls are trying to lose weight (Schreiber et al, 1996).
- Adolescent girls who smoke often cite fear of weight gain as a reason not to stop; other avoid using birth control pills for the same reason (Pipher, 1995).
- Thirty-five percent of "normal dieters" progress to pathological dieting. Of those, 20-25% progress to partial or full-syndrome eating disorders (Shisslak, Crago and Estes, 1995).
- More than twice as many girls as boys use pathogenic weight control techniques (Neumark-Sztainer et al, 2002). Girls are more likely than boys to fast for 24 hours or longer (19% vs. 8%), use diet pills, powders or liquids without a doctor's advice (13% vs. 5.5%) or vomit or take laxatives (8% vs. 3%) to lose or avoid gaining weight (Centers for Disease Control and Prevention, 2002).

- White girls are at higher risk than black girls, partly because they are more likely to adopt excessively thin standards of beauty (Thompson and Sherman, 1999). White adolescent girls are six times more likely than black girls to use pills or vomiting to manage their weight (Neff et al, 1997).

- Young women that have anorexia nervosa are 12 times more likely to die than others of that same age without anorexia nervosa (National Association of Anorexia Nervosa and Associated Disorders, 2004).

The Facts and Research Findings

Female athletes are at especially high risk for pathogenic weight control. In fact, eating disorders, amenorrhea and osteoporosis make up a triad of medical disorders known as the "female athlete triad," which undermine health and (ironically) athletic performance (Beals, Brey and Gonyou, 1999). It is unclear whether athletic participation alone creates a risk for disordered eating or whether girls and young women already at high risk for such behavior or more likely to be attracted to sports (Sundgot-Borgen, 1994), because certain personality traits tend to be associated with both eating disorders and athletic participation: competitiveness, drive, self-motivation, compulsiveness, perfectionism and preoccupation with body shape and composition (Taub and Blinde, 1992).

- The highest prevalence of eating disorders is found among white female athletes in aesthetic sports (those that are subjectively scored on the basis on appearance or form, such as figure skating or gymnastics) and weight-dependent sports (those that depend on leanness or low weight for optimum success, such as distance running or cycling) (Hausenblas and Carron, 1999; Sundgot-Borgen, 1994; Thompson and Sherman, 1999).

- Black female athletes report lower rates of eating disorders, disordered eating or body dissatisfaction; this difference is partly a matter of different subcultural standards of beauty and partly a matter of disproportionate participation in sports that don't place a premium on appearance or leanness (e.g., basketball) (Rhea, 1999; Thompson and Sherman, 1999).

- Unhealthy and disordered eating, as well as full-fledged eating disorders, are more common among female athletes (95% of cases) than male athletes. Athlete prevalence is between 5% and 33%, depending on the sport in question; these rates are for the most part significantly higher than in the general population (Patel et al, 2003).

- A comprehensive review of 92 recent studies found that female athletes, especially those in aesthetic sports, report more bulimic and anorexic behavior than non-athletes. Most of these studies focused on college-aged young adults (Hausenblas and Carron, 1999).

- According to one study conducted by the NCAA, 9% of female college athletes have clinically significant problems with bulimia and 3% have clinically significant problems with anorexia. 11% reported binge eating at least weekly; 5.5% reported purging through the use of self-induced vomiting, laxatives or diuretics (Johnson, Powers and Dick, 1999).

- The link between sport and pathogenic weight control techniques is weaker at the high school level. Some studies find that high school female athletes are at somewhat higher risk than their non-athlete peers (Hausenblas and Carron, 1999; Miller et al, 2000; Taub and Blinde, 1992); others do not, possibly because competition at the high school level is less intense than at more advanced levels (Fulkerson et al, 1999; Rhea, 1999).

- Some researchers suggest that some aspects of sports participation may actually buffer girls against disordered eating, such as increased self-esteem, positive body image or (in some sports) an emphasis on mass and power rather than on a feminine aesthetic of thinness or fragility (Fulkerson et al, 1999; Hausenblas and Downs, 2001; Mosley, 1997; Rhea, 1999; Taub and Blinde, 1992).

- Athletes are at high risk because they often face unique pressures to maintain a particular body weight or shape. Failure to do so can have significant financial or social consequences. Coaches may also impose strict weight standards and an athlete's body may be further subjected to intense and sustained scrutiny and judgment by large numbers of spectators (Beals, Brey and Gonyou, 1999; Hausenblas and Carron, 1999).

- Pathogenic weight control techniques may be perceived as "normal" within an athletic context, such as wrestlers who fast and dehydrate in order to make a specific weight class, ballet dancers who routinely purge or gymnasts who stop menstruating due to inadequate nutrition (Thompson and Sherman, 1999).

- The dynamics of sports team interaction may contribute to disordered eating "contagion," particularly when coupled with strong pressure from coaches to maintain a rigorous weight regimen. Group weigh-ins promote competitive thinness; athletes also see each other's bodies in the locker room and discuss strategies to enhance performance and appearance. Pathogenic weight control techniques are often passed from one athlete to another (Thompson and Sherman, 1999).

V. Educational and Social Dimensions

American girls faced gender bias in education throughout most of the 20th century. High school and college females were expected to depend on their husbands' achievements to succeed within the larger economy. Certain academic subjects and careers in science and mathematics (like sport itself) were labeled "masculine" by many educators and school advisors (Damarin, 2000). Recently, however, girls are emerging out of feminine stereotypes and excelling in education. One survey of 1,000 high schools in 26 states found that 84% of the females said it was important to continue their education beyond high school, 70% thought it would be useful to do well in school achieve life goals and 67% try to do their best in school. The pro-education orientation of young females is further demonstrated by the fact that 74% of girls graduate from high school compared to 67% of boys (USA Today, 2003). Women's percentage of earned college degrees went from 24% in 1950 to 56% in 1996 (U.S. Bureau of the Census, Statistical Abstract of the United States, 2000).

A variety of research findings suggest that for many girls athletic participation is a positive component of their academic aspirations and achievement. However, as noted below not all girls are able to take full advantage of the benefits organized sports have to offer. For example, while Hispanic girls are likely to realize a number of educational advantages from their participation, research suggests that African-American girls are sometimes negatively impacted by their participation in sport.

Sport and Academic Gains

Background

Contrary to the "dumb jock" myth, research shows that female high school athletic participation is often linked with favorable academic outcomes ranging from better grades, fewer disciplinary referrals, lower rates of absenteeism and school dropout, increased desire to go to college and commitment to the school. Both athletic participation and academic performance are influenced by lots of factors including socioeconomic background, race and ethnicity, the quality of a school system and family encouragement. The overall findings show that sports are mainly an asset for both girls and boys across from diverse racial/ethnic and economic backgrounds. It is also evident that poverty and racial discrimination confound the positive interplay between athletic participation and academic performance.

The Facts and Research Findings

- Girls who participate in sports are more likely to experience academic success and graduate from high school than those who do not play sports (Sabo, Melnick and Vanfossen, 1989).
- High school students who initially have better grades tend to self-select into high school sports programs (Sabo, Melnick and Vanfossen, 1989).
- Student-athletes in high school tend to do better academically over time (Crosnoe, 2002; Eccles and Barber, 1999; Marsh and Kleitman, 2003; Videon, 2002).
- High school female athletes expressed a greater interest in graduating from college (Melnick, Vanfossen and Sabo, 1988).
- A longitudinal study of 22,696 high school students in 1,052 schools found that both female and male athletes had higher grades, higher educational aspirations and less school-related discipline problems than non-athletes (Fejgin, 1994).
- A nationwide sample of high school students was followed between the sophomore and senior years. The positive educational impacts of school sports were just as strong for girls as for boys including self-concept, educational aspirations in the senior year, school attendance, math and science enrollment, time spent on homework, and taking honors courses (Marsh, 1993).

- Black and Hispanic/Latino female athletes reported better grades in high school and greater involvement with extracurricular activities than female non-athletes, but these effects were more short-lived than for whites, for whom high school sports participation was associated with higher rates of college attendance and completion (Sabo, Melnick and Vanfossen, 1989).

- In rural schools, Hispanic female athletes were three times less likely to drop out than non-athletes (Sabo, Melnick and Vanfossen, 1989).

- Hispanic female athletes (especially from rural schools) were more apt than non-athletes to improve their academic standing while in high school, to graduate and attend college following high school (Sabo, Melnick and Vanfossen, 1989).

- High school athletic participation significantly lowered the dropout rates for white females in suburban and rural schools (Sabo, Melnick and Vanfossen, 1989).

- After finding that high school sports participation positively influenced 14 out of 22 senior and postsecondary educational outcomes (and no negative impacts on the remaining eight outcomes), Marsh (1993) concluded, "participation in sport apparently adds to—not detracts from—time, energy and commitment to academic pursuits" (p. 35).

- A nationwide sample of young people was studied between their sophomore and senior years in high school and for four years after high school (1988-1994). Students involved with school sports had higher grades, more Carnegie units and higher educational aspirations. Athletes spent more time on homework and applied to more universities. Two years after high school, former athletes were more likely to be enrolled in university and to hold higher educational aspirations Marsh and Kleitman, 2003).

Mathematics and Science Achievement

Background

For decades in American education, gender stereotypes about boys' "innate ability" for mathematics and science and girls' "natural dislike" for these subjects pushed many coeds out of calculus, physics and chemistry classes in American high schools. For many girls, this meant that the educational doors to technical and scientific careers were closed in their faces.

- By high school only 29% of girls, compared to 53% of boys, think they would enjoy being scientists (American Association of University Women, 1991).

- In 2000, 21% of the Ph.D.s in mathematical/computer sciences and 15.7% of the Ph.D.s in engineering at American universities were awarded to women (National Science Foundation/Division of Science Resources Statistics, 2000).

The Facts and Research Findings

Some well-crafted research shows that, for girls, sport and elevated performance in science and mathematics can go hand-in-hand. Female high school athletes performed better in math and science courses than their female non-athletic counterparts. Just as millions of females broke down the "sports = masculinity" cultural equation after Title IX in 1972, it appears that female athletes are demonstrating that girls can excel in the formerly male-dominated areas of mathematics and science.

- High school girls who play sports are more likely to do well in science (Hanson and Kraus, 1998, 1999).

- One study followed a nationwide sample of 11,683 high school students between their sophomore (1980) and senior years (1982). Compared to female non-athletes, female athletes reported greater access to and more positive attitudes toward science and math courses. These findings were especially marked among white females from higher socioeconomic backgrounds (Hanson and Kraus, 1998).

- A nationwide sample of 8,325 young women was studied between their eighth-grade year in 1987-88, through their sophomore and senior years and two years after high school (1994). Sports participation had positive effects for math and science access, attainment and attitude, with the strongest influence occurring in the sophomore year (Hanson and Kraus, 1999).

Exercise and Learning

Background

Exercise itself may be associated with increased cognitive energy and learning. At a time when physical education classes are being dropped from many school curriculums, evidence suggests that physical activity and learning go hand-in-hand (Action for Healthy Kids, 2003).

- Physical exercise may boost brain function, improve mood and otherwise increase learning (King, 1999)
- A review of almost 200 studies on the links between exercise and cognitive functioning reported that physical activity buttresses learning (Etnier et al, 1997).
- Several studies document links between physical activity programs to favorable academic outcomes such as better test scores, increased concentration and enhanced performance in math and reading (Shephard et al, 1984; Shephard, 1997; Symons et al, 1997).

Facts and Research Findings

Ironically, as research findings emerge that show favorable linkages between exercise and classroom learning, participation in school physical education classes is decreasing—and the decline appears to be steeper for girls than boys.

- The percentage of students taking daily physical classes dropped from 42% to 29% between 1991 and 1999 (Centers for Disease Control and Prevention, 2003).
- Overall, male students (87.7%) in physical education (PE) class are significantly more likely than female students (78.8%) to have exercised 20 or more minutes during an average PE class (Centers for Disease Control and Prevention, 2002).
- Nationwide 51.7% of students are enrolled in PE class. Approximately one-third (32.2%) of students nationwide attend PE class daily. There are no significant sex differences in participation in ninth- and 10th-grade, but male students in grade 11 (30%) are significantly more likely than female students (15.6%) to have attended PE classes daily. In grade 12, males (26.1%) are significantly more likely than female students (14.7%) to have attended daily PE class (Centers for Disease Control and Prevention, 2002).

VI. Athletic Interest and Participation

Interest in Sports

Background

Title IX opened the doors of athletic opportunity to girls in 1972, and, since then, female participation in all levels of American sports has increased. While data exist on female participation rates in sport, little is known about what gets and maintains girls' interest in sports and physical activity.

The Facts and Research Findings

Why some young girls take an interest in physical activity and sports while others do not has attracted some attention among researchers. Girls get involved with sports for lots of reasons that include self-image, body-image, peer support, parental encouragement, presence of role models and cultural supports (not barriers). Girls and their families also need to be provided with program resources, safe venues and opportunities to participate in schools and communities.

- Girls who engage in more "masculine" childhood activities such as dodgeball, basketball or football were more likely to get involved with organized sports (Giuliano, Popp and Knight, 2000).
- Girls who played in mainly male or coed groups as children were more likely to participate in sports later in childhood (Women's Sports Foundation, 1988; Giuliano, Popp and Knight, 2000).
- Fourth- through sixth-grade girls (and boys) are more likely to show interest in physical activity if their parents encourage them, enjoy physical activities themselves and model a physically active lifestyle (Green and Chalip, 1997; Brustad, 1996; Leff and Hoyle, 1995).
- For middle-school girls, perceptions of belonging (e.g., being part of a team, being with friends and acceptance by others) were very much related to their interest in, and enjoyment of, physical activity and sport (Allen, 2003; Prochaska, Rodgers and Sallis, 2002; Smith, 1999).
- One study of high school girls revealed the main reasons for quitting sports were injury (26%), time conflicts (18%), conflict with coaches (16%) and boredom (14%) (Stewart and Taylor, 2000).
- A study of ninth-, 10th- and 12th-grade teenagers found that, for both girls and boys, peer relationships played a key role in their continuing involvement in, and commitment to, their sport (Patrick et al, 1999).
- A survey of more than 500 college students found that the number-one reason female athletes persisted in their participation was "personal fulfillment" (62%). The most commonly cited reasons for leaving their sport were "other activities prevented participation" (51%) and "low perceived ability" (17%) (Martin, 1997).
- Excessive commitment to a special sport talent can lead to feelings of entrapment and burnout among some female athletes (Weiss and Weiss, 2003).
- Urban girls, especially girls of color, often face unique barriers to participation. Many have jobs in order to supplement family incomes, while others take care of siblings at home. In some ethnic groups, parental support for girls' athletic participation may be lacking (Place, 2004).

High School Sports and Physical Activity

Background

The increase in the number of girls who participate in high school sports since the early 1970s is nothing less short of spectacular.

- In the 1971-72 school year, just one girls in 27 participated; in 2002-03, it was one in three. A total of 2,856,358 girls played high school sports during 2002-03, an increase of 872% over the 1971-72 base year (National Federation of State High School Associations, 2003).

- The five most popular sports were basketball (457,165), track and field: outdoor (415,602), volleyball (393,682), softball: fast pitch (357,912) and soccer (301,450).

Female interest in competitive sports now extends well past such "gender-appropriate" sports as tennis, swimming, golf and gymnastics (Brady, 2003).

- The 2002-03 data show a female presence in such nontraditional and "masculine" sports as riflery (1,244), 11-player football (1,477), baseball (1,622), wrestling (3,769), weight lifting (4,372), ice hockey (6,628) and water polo (15,870) (National Federation of State High School Associations, 2003).

While the absolute increase in the number of female high school athletes since the early 1970s has been impressive, the percentage of females playing varsity sports has remained flat over the past three years. Whereas 46.6% of high school males participate in high school varsity sports, the corresponding statistic for females is 33.5%.

Specifically, girls' participation rose about one percentage point each year over the past decade but remained constant for the last three years (Sylwester, 2003). This pattern is due to several factors. First, the addition of new sports for girls has slowed down as school districts across the country struggle to overcome dwindling resources. Second, as school enrollments increase, the percentage of students playing sport drops even though team rosters remain full (Brady and Sylwester, 2003). Finally, as school enrollments grow larger, it becomes increasingly more difficult for females to gain membership on varsity teams. Without an expansion of opportunities for female athletes, the percentage of girls in varsity sports is likely to remain flat for the foreseeable future because it is predicted that high school enrollments will continue to rise until peaking in 2007 when 14.8 million students are expected to enroll.

- High school boys receive 40% more chances to play varsity sports than girls (National Federation of State High School Associations, 2003).

- Boys experience a 10% decline in sports participation between middle school and high school, whereas girls experience a 23% decline in participation (U.S. Secretary of Health and Human Services and U.S. Secretary of Education, 2000).

- If a girl does not participate in sports by the time she is 10, there is only a 10% chance she will participate when she is 25 (Bunker, 1988).

There are also troubling indications of a decline in children's participation in physical education and exercise, especially in poorer communities and school districts.

- Adolescent girls are significantly less likely than boys to report sufficient vigorous physical activity (Centers for Disease Control and Prevention, 2002; U.S. Secretary of Health and Human Services and U.S. Secretary of Education, 2000).

- Female students in grades 11 and 12 are nearly half as likely as male students to have attended PE classes daily (Centers for Disease Control and Prevention, 2002).

- In one sports league (primarily softball) for girls in the mostly Dominican Washington Heights/Inwood section of Manhattan, child-care responsibilities were a significant issue, as was lack of support from parents, especially for older girls (Baker, Freedman and Furano, 1997).

- Overall, male students (87.7%) in physical education class are significantly more likely than female students (78.8%) to have exercised 20 or more minutes during an average PE class. (Centers for Disease Control and Prevention, 2002).

- Recess and physical education are disappearing from urban school schedules (Halpern, 2003).

- Boston girls participate in sports and physical activity programs at about half the rate of boys (Cradock et al, 2002).

- Just over one-fourth of New York City high school girls (26%) participated in high school sports in 1997 compared to 42% of girls nationwide (Centers for Disease Control and Prevention, 1999).

- Fewer than one in five children in Georgia who live less than a mile from school walks to school on a regular basis (Centers for Disease Control and Prevention, 2002).

- About 14% of young people report no recent physical activity. Inactivity is more common among females (14%) than males (7%) and among black females (21%) than white females (12%) (United States Surgeon General, 1996).

Many girls who want to become physically active face unique obstacles, particularly poor girls and girls of color.

- The majority of youth programs and drop-in centers for older children and adolescents have male-oriented, if not male-dominated cultures. Although girls are welcome and some sports activity is co-ed, girls sometimes feel marginalized (Halpern, 2003).

- For girls, some gender-associated constraints to physical activity include lack of role models, social pressures, body image issues, lack of parental encouragement (important in part because girls reportedly rely more than boys on such encouragement) and fewer sports choices (Team up for Youth, 2002).

- Girls sometimes feel less safe in public recreation spaces and use those spaces more for social than for physical purposes, including watching boys play sports (Team up for Youth, 2002).

- Nationwide 51.7% of students are enrolled in physical education (PE) class. Approximately one-third (32.2%) of students nationwide attend PE class daily. There are no significant sex differences in participation in ninth- and 10th-grade, but male students in grade 11 (30%) are significantly more likely than female students (15.6%) to have attended PE classes daily. In grade 12, males (26.1%) are significantly more likely than female students (14.7%) to have attended daily PE class (Centers for Disease Control and Prevention, 2002).

- Substantial declines in physical activity occur during adolescence in girls and are greater in black girls than in white girls. One study of 1,213 black girls and 1,166 white girls conducted over 10 years from the time the girls were 9 or 10 to the ages of 18 or 19 years found a 100% decline for black girls and a 64% decline for white girls. By the age of 16 or 17 years, 56% of the black girls and 31% of the white girls reported no habitual leisure-time activity (Kimm et al, 2002).

College Sports Participation

Young women's participation in intercollegiate athletics mushroomed after the passage of Title IX. Increases occurred among Caucasian women and women of color (Women's Sports Foundation, 2003).

- Between 1971-1972 and 2000-2001, overall female participation in college athletics increased from 15% to 42%. The increase among women of color was 7% to 15% for that time period (Women's Sports Foundation, 2003).

- Overall female participation in intercollegiate sports increased by 407% between 1971-1972 and 2001-2002 (NCAA, 2001-2002).

- The average number of athletic teams offered by colleges and universities to females in 1978 was slightly above 2, compared with 8.32 in 2004 (Acosta and Carpenter, 2004).

Despite these gains in participation, gender inequalities persist.

- Few intercollegiate institutions provide participation opportunities for female athletes in proportion to the number of women in the general student body. In 1995-96, while women were 53% of all undergraduate students, they were only 37% of NCAA athletes (Sabo, 1997).

- A nationwide survey of NCAA institutions found that women athletes received $142,622,803 less in scholarship aid than their male counterparts during the 1995-1996 year (Sabo, 1997). The NCAA measured this discrepancy at $133 million for 1999-2000 (1999-2000 NCAA Gender-Equity Report).

- NCAA institutions are not as committed to recruiting women athletes as male athletes. In the 1995-1996 year, women received only 26.6% ($16,322,470) of the total $61,413,179 spent by colleges and universities on recruitment (Sabo, 1997).

Incentives for Future Careers in Sport

As young female athletes grow up, like generations of male athletes before them, many want to stay involved with sports. They dream about careers in athletic administration, coaching, sports management and sports medicine. But their career aspirations often collide with gender barriers that exist in most male-dominated sport organizations. Ironically, it has been mainly men who have entered the thousands of sport-related jobs that have been created by the growth of women's sports during the past three decades.

- In 1972, 90% of all the coaches of women's NCAA athletic teams were women. By 2004 women were 44.1% of head coaches of women's sports teams (Acosta and Carpenter, 2004).

- For 30 years, the percentage of women coaches of men's intercollegiate teams has remained under 2% (Acosta and Carpenter, 2004).

- Women administrators directed 90% of women's intercollegiate sports programs in 1972, compared to only 18.5% of such programs in 2003-2004 (Acosta and Carpenter, 2004).

- In American colleges and universities in 2004, women comprised 12.2% of intercollegiate sports information directors and 30% of fulltime athletic trainers (Acosta and Carpenter, 2004).

Influence of Media on Athletic Participation

Background

Much content-based analysis research has been done to establish that female athletes are vastly underrepresented when it comes to positive portrayals in the media. This is so despite the fact that the passage of the federal civil rights legislation Title IX 30 years ago has given girls and young women unprecedented access to athletics and they now play and excel in sports of all kinds. The majority of this work has shown that female athletes continue to be pictured through gender stereotypes outside the range of athletic accomplishment while there is simultaneously far more attention paid to men's sports and male athletes (Eastman and Billings, 1999; Davis, 1997; Kane, 1996; Higgs and Weiller, 1994; Duncan, Messner and Williams, 1991). Because female athletes threaten the traditional link between femininity and weakness and masculinity with strength and action, representational codes work to contain that threat and put women "back in their traditional place" (Kane, 2003; Daddario, 1998; Kane and Lenskyj, 1998; Duncan and Messner, 1994, 2000; Alexander, 1994; Kane, 1992, 1994, 1996; Duncan 1990). The assumption in this research is that codes within the media productions send the message that women and women's sports are inferior to men and men's sports and that audiences will therefore absorb and believe those messages.

Research has yielded a substantial body of knowledge regarding the ways sport is presented in the mass media. Several differences have been found in the representation of men and women athletes. It is well documented that women receive strikingly less coverage than men, even in sports in which women in fact constitute a majority of the participants (Shifflett and Revelle, 1994; Alexander, 1994; Duncan et al, 1994; Salwen and Wood, 1994; Cohen, 1993; Lumpkin and Williams, 1991; McKay and Rowe, 1987). Women who participate in sports

considered "too masculine" for women, are often depicted negatively. The language used in media is a powerful means of reinforcement for gender stereotypes. Descriptors involving talent and skill are often absent in portrayals of women athletes. References more typically utilize expressions of aesthetic appeal such as "beauty" or "grace" and focus on the athlete's "femininity" or lack of it. Male athletes are usually depicted in favorable terms such as manly, strong or aggressive. Women are also often framed in terms not their athletic achievements but instead for their social positions (or lack thereof), as girlfriends, wives or mothers (Knight and Guiliano, 2001; Lenskyj, 1998; Pirinen, 1997; Birrell and Cole, 1994; Creedon, 1994; Halbert and Latimer, 1994; MacNeill, 1994; ; Cohen, 1993; Kane and Disch, 1993; Kane and Greendorfer, 1994; Messner, Duncan, and Jensen, 1993; Kane and Parks, 1992; Blinde, Greendorfer, and Shanker, 1991; Duncan and Hasbrook, 1988; Messner, 1988; Hillard, 1984).

- The media contributes to gender role stereotypes and this has a negative effect on female athletes, who are seen as being at odds with those steretotypes (Koivula, 1999; Pirinen, 1997; Kane, 1996; Creedon 1994; Birrell and Cole, 1994; Kane and Parks, 1992; Duncan, 1990; Rintala and Birrell, 1984).

- Men's sports are represented far more often than women's (Duncan and Messner, 2000; Daddario, 1998; Davis, 1997; Alexander 1994; Leath and Lumpkin, 1992).

- Any positive cultural change that might occur because of the increasing visibility of female athletes are contained by the way athletes are represented (Kane, 1992, 1994, 1996, 2003)

- Gendered language is consistently used in sport broadcasting (Duncan, Messner and Williams, 1991; Messner, Duncan, and Jensen, 1993; Halbert and Latimer, 1994)

- Female athletes are often defined in terms of their social role, not their position as an athlete (Blinde, Greendorfer and Shanker, 1991; Davis, 1997; Duncan and Hasbrook, 1988; Duncan and Messner, 2000).

- By the time a girl is 17 years old she has seen more than 250,000 commercial messages telling her what to eat, what to wear, what to buy and how to look Mediascope (2003).

Facts and Research Findings

The research on the representation of women in sport in the media has been limited by the fact that almost all studies in this area have done content analyses of media rather than reception studies. There is a good deal of information about how female athletes are portrayed, but not information about how various representations are actually interpreted by girls themselves. A crucial question left unanswered by this research is whether or not these media representations have a negative effect on girls' and women's sport participation. To some extent, the fact that participation has increased exponentially in the years since Title IX suggests that many girls and women will play sport regardless of how that play is represented. On the other hand, if there were more positive portrayals of women in sport, it is possible that many more girls and women would get involved.

A few researchers argue that there has been some positive change in media representations of athletic women and that "it is time to recognize that most of today's journalists are more than willing to acknowledge the strength, endurance, toughness and skills [of female athletes] (Guttmann, 1996) and that *some* emphasis on their sexuality does not completely negate that acknowledgement. Others have found that positive representations of female athletes in the media make children want to play sports (Heywood and Dworkin, 2003) and that positive portrayals led to positive and equitable opinions being formed by the viewer as to the status and roles of women in society (Angelini, 2003). Contrary to the researchers' expectations, negative portrayals of female athletes, as well as both positive and negative portrayal of male athletes, did not appear to influence girls' opinions of women's roles (Angelini, 2003). Studies that evaluate how female athletes see themselves (as opposed to how others see them) show that athletic participation does not induce gender role conflict and that female athletes are respected by both genders (Royce, Gebelt and Duff, 2003).

Media, Homophobia and Athletic Participation

Background

Many researchers have linked the stereotypical media coverage of women in sports to homophobia. It is emphasized that when female athletes are presented in sexual ways, in hyper-feminized terms and in ways that emphasize their lives outside of their athletic accomplishments, homophobia is at work. Research has shown that this happens because the traditional association of physical strength, power and athleticism with masculinity causes many people to question the sexuality of female athletes, simply because athletes show strength, competitiveness and athleticism, which are traditionally seen as "masculine." Traditional ideas about femininity emphasize qualities that are the opposite qualities an athlete—weakness, nurturing tendencies and passivity. Therefore female athletes challenge traditional notions of femininity. The media do not raise questions about these traditional gender assumptions or typically depict female athletes as possessing both feminine and masculine traits. Instead the media tend to reflect homophobia by purveying the assumption that if a woman is strong and competitive, she must be lesbian (Griffin, 1998; Terwilliger, 1995; Lenskyj, 1995).

Facts and Research Findings

- This assumption that female athletes are lesbian sometimes leads women's sports organizations and female athletes to consciously present themselves as heterosexual and as unthreatening to traditional stereotypes of femininity in order to remain socially acceptable and marketable (Festle, 1996; Griffin, 1993; *Women in Sport and Physical Activity Journal*, 1997: Lenskyj, 1995).

- Homophobia can influence the type of sports women and girls choose to participate in, because some sports, such as boxing or football, are seen as more inherently masculine and thus carry more stigma (Nelson, 1994, Koivula, 1995).

- Homophobia has been used as a tool to scare both homosexual and heterosexual women away from sport participation. Since coaches sometimes use "lesbian baiting" as part of their recruitment tactics by implying or stating outright that women who play sports at a particular school are lesbian, this has the effect that straight or lesbian women will avoid that school or avoid sports entirely (Lenskyj, 1987; Krane, 1996; Young, 1994; Blinde and Taub, 1992; Disch and Kane, 1996).

- Homophobia erodes the physical and emotional well-being of girls when it complicates or blocks female participation in sports and other physical activities (Griffin, 1998; Disch and Kane, 1996; Cahn, 1993, 1994; McClintock, 1996).

Conclusion

The bulk of research findings cited in this report show that physical activity and sport can enhance the health and well-being of American girls and young women, and at a time when public health experts estimate that obesity and sedentary lifestyles are responsible for 400,000 deaths per year in the United States. Inactivity and obesity in the current generation of girls will yield a substantial burden of disease for women in the future. The preventive health message is clear: girls and young women deserve and need full access to opportunities for participation in physical activity and sport.

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