

oxygen uptake (VO_{2max}) levels were measured. Analyses showed that boys spent more hours on leisure activities than girls. They spent more time engaging in leisure physical activity and on TV viewing, computer games and internet than girls. They also had higher VO_{2max} and lower BMI than girls. It is plausible that the reason for the lesser hours spent by girls in leisure time is that they spend more hours on household chores than boys [5].

The third study involved Grade 3 and 4 boys participating in a summer camp in the Muscat area. They were asked to complete a 1.6 km run/walk. They also filled out a student and parent questionnaire reporting on the family's lifestyle and health status. A total of 109 boys, equivalent to a response rate of 96%, completed the questionnaire.

Sixty eight percent completed the distance running; the others combined running and walking. Parents reported that children watched TV or played computer/video games for an average of 3.2 hours per day. As for the data on the parents, 32.5% of the fathers and 8% of the mothers exercised at least twice weekly. A high father's exercise score was correlated with better child's performance and leanness while mother's obesity had a negative correlation [6].

Children's attitudes towards physical education and actual involvement in activities were the foci of two studies. The first involved newly enrolled students at Sultan Qaboos University (SQU) and the second involved 12 to 15 year-old children enrolled in a summer camp at SQU. The participants in the first study were 352 newly enrolled students at SQU. The study investigated the students' attitudes towards physical activity and their perceived values of six sub domains of physical activity, namely, the social, health, competing, aesthetic, catharsis, and ascetic. Students were selected at random and represented 14% of accepted students. The findings showed that both males (62% of the sample) and females (38% of the sample) exhibited positive attitudes toward physical activity with 91% engaging in regular weekly physical activity varying from less than two hours to more than 6 hours. Students had highly positive attitudes toward the health sub domain, positive attitudes toward the social, catharsis, aesthetic, and competing sub domains, and slightly unfavorable attitudes toward the ascetic sub domain [7].

The second study involved approximately 50% of children between 12 and 15 years old participating in the Summer Club at SQU. Results showed that the 147 children held positive attitudes towards physical activity as an avenue to promote health, socialization, and competitiveness. However, this study also found that participants had negative attitudes to the ascetic sub domain of physical activity. They were not comfortable with physical activity as an avenue for adventure. They did not

want to take risks that could lead to injuries or involve dangers [8].

At the country level, a total of 2979 students in grades 7 to 10 participated in the 2005 Global School-Based Student Health Survey (GSHS) Results. They answered questions regarding their health and physical practices.

Among the participants in GSHS, 74% were physically active during the past 7 days for a total of at least 60 minutes per day. The rest were active mostly one or two days of the week. They sat for less than one hour per day (34.2%), one to two hours per day (31.4%), or 3 or more hours per day (34.3%). They walked or rode a bicycle to school (37%). Among the students who walked or rode a bicycle to school, 79% took 29 minutes or less per day [9].

Reviewed studies portray a rough profile of Omani children. They have a positive attitude towards physical activity but don't engage in physical activities for long periods, with girls engaging less than boys.

3. Interventions

Preventive measures are needed to address the risk factors associated with NCDs such as inactivity, rising levels in smoking, overweight, and obesity. Physical activity is a main preventive measure as it improves bone health and reduces the risk of developing type 2 diabetes, cardiovascular diseases, and obesity [10].

The Omani government is collecting statistics and providing services to people in all regions. The Ministry of Health is sponsoring many programs that aim to raise awareness regarding NCDs. One such initiative is a community-based intervention in Nizwa, Oman. The Nizwa Healthy Lifestyle Project (NHLP), started in 2004, aims to address the risk factors of NCDs through three subcommittees: tobacco control and accident prevention, promotion of physical activity, and promotion of healthy nutrition. The interventions include identification of NHLP Friendly Schools, implementation of the gulf program Alharaka Baraka (Move for Health) to raise activity in primary schools, lifestyle clinic, obesity screening and management, tobacco intervention, health education in schools and tobacco cessation clinic, and health professionals education and involvement [11].

A study using multistage random sampling was conducted in Nizwa between March and May 2006 to investigate the type and level of physical activity among students. The area is located about 175 km from the capital, Muscat, and is inhabited by about 70,000 persons. It includes about 77 villages including Nizwa center. The participants were 509 boys and girls between 9 and 20 years old. Eighty percent did not have chronic diseases and 90% engaged in physical activities. The most common

activities were walking, running, and playing soccer, with girls mostly walking and running. Girls played at home and at schools while boys played less at home and more at schools, open playgrounds and fields. More than a third of the students were not involved in physical activity at a level that would be enough to prevent a rise of the risk factors at an older age. In adulthood, physical inactivity was about 70% in females and 50 % in males [12].

Physical activity is influenced by social, behavioral, cultural, and physiological factors. People were inactive for many reasons, namely, lack of awareness of the benefits of physical activity, social values that could restrict women's participation in activities in open spaces, shortage to non-availability of public places for physical activities, and the use of modern life accessories such as cars, TVs, computers, sedentary lifestyles [13]. As a result of the study, the authors recommended using schools to impart information on health and physical fitness, to increase opportunities at schools for children to engage in sports, and to implement the program "Move for Health" for children less than 12 years old in 10 primary schools in Nizwa. Parents are more involved in their children's lives at the formative years. Reaching them and enlisting their cooperation at home to instill healthy habits in children would be effective.

4. The Basic Education Curriculum

With the shortage of public places for physical education for boys and girls and scarcity of extra curricular programs, it seems logical as was concluded by the NHLP study to use schools as centers for implementing a solid plan to address risk factors.

Given that the schooling system spans over 12 years, the concepts of a healthy lifestyle throughout the school years could be delivered in a systematic manner. There is no reason to wait for the adulthood period to address the issue with the new generation. The ideal is to start at the basic education level.

According to the National Association for Sport and Physical Education (NASPE), children should accumulate at least 60 minutes of physical activity on all if not most of the days. Periods of activity lasting at least 15 minutes should be spread out throughout the day and include different types of moderate and vigorous activities. The children should be active every couple hours if not earlier. One way to do so is to integrate physical concepts and activities in all subjects [14]. A study in New Zealand gives one example of an initiative to integrate physical activity throughout the subjects and to motivate children to develop habitual physical activity. The study investigated the effect of implementing a 4-week unit that integrates physical education throughout English, social studies,

mathematics, and statistics for elementary students aged 8 to 10 years. Children wore pedometers at baseline and throughout the 4 weeks. The average daily step count was computed prior to and during the intervention. Results for 61 children indicated increased daily steps for the least active among boys and girls [15].

Physical education should offer opportunities for competitive sports but more important, it should expose children to a variety of physical activities or sports that could engage children in habitual physical activity throughout life [16].

An examination of the Omani educational system reveals that the first stage of basic education includes Grades 1 to 4. The subjects include Islamic Education, Arabic, English, Mathematics, Sciences, Social Studies, Physical Education, Artistic Education, Music Education, Environmental Life Skills, and Technology. The total is about 40 periods per week. The subjects are delivered using a variety of teaching methods to meet the needs of diverse learners. There is also integration among certain subjects but physical education is not one of them. It occupies 2 periods per week at each grade level [17].

The Ministry of Education is also implementing an experimental integrative approach in a limited number of schools with a potential for expansion to more schools. Physical Education occupies 3 periods per week (2 hours and 15 minutes) in grades 1 and 2 but it decreases to 2 periods (1 hour and 30 minutes) in grades 3 and 4. The subject remains non-integrated with other subjects [18].

The allocated time is less than the recommended NASPE guidelines. One justification could be that physical activity is viewed as achieved at the expense of academic performance.

However, many studies that investigated the relationship between school-based physical education/activity and academic performance found encouraging results.

Starting with the preschool years, a review of studies that investigated the environmental factors affecting preschoolers' motor development found that the preschool experience is related to the children's physical activity levels. Developmentally appropriate physical programs, open spaces, and appropriate equipment were related to higher gross motor scores [19]. In addition, organized physical activity such as intervention movement programs can have a positive effect on the acquisition of the performance levels that represent the natural pattern of the skill. In one study, 75 children aged between 5 and 6 years were divided into three groups. Experimental Group A participated in a movement program, experimental Group B participated in a music and movement program where a rhythmic component was added to the movement program, and Group C participated in free play activities as scheduled in the preschool program. Groups A and B

received instruction from a physical educator twice weekly for 35 minutes each time over a period of 10 weeks. Fundamental locomotor skills under study were running, galloping, hopping, leaping, horizontal jump, and skipping. The skills were measured before and after intervention. Results showed that the skills of the two experimental groups, with or without the rhythmic component, significantly improved their skills in comparison with the control group [20].

At the elementary grade levels, a report summarizing the research on the relationship between academic performance and physical education found that five studies show that allotting more time for physical education did not have any adverse effect on academic performance. Even regular physical activity was an asset to academic performance. Out of 14 studies published between 1967 and 2006, 11 found improved academic performance associated with regular physical activity, two found no relationship between the two, and only one study reported a slightly negative association. Although more research is needed to analyze the mechanisms that relate physical activity to academic performance, activity breaks between classroom lessons increased on-task classroom behavior for elementary students and were even more evident for off-task students [21]. The recommendation for activity breaks between classroom lessons is in concordance with NASPE guidelines [14].

The above studies were reviewed without accounting for the type of design. A comparison between quasi-experimental and cross-sectional studies conducted between 1960 and 2007 confirmed most of the aforementioned results. Two authors researched studies published from 1966 to 2007 via medline, psycinfo, scholar.google.com, and ERIC Databases. They analyzed studies that used quasi-experimental, cross-sectional, and experimental designs. They found that physical education hours could be increased up to an additional hour per day without affecting academic performance. Specifically, six quasi-experimental studies showed that enriched physical education programs did not adversely affect academic performance but in some instances improved it. Ten cross-sectional studies were also reviewed. Physical involvement improved academic achievement in six studies and showed no relationship with academic achievement in two studies. In two studies, physical activity was negatively correlated with academic achievement [22].

Responsive classroom behavior, positive self-esteem, and school satisfaction were positively correlated with increased physical activity levels. However, taking away time from physical education classes did not improve academic achievement and could be associated with development of health risk factors later in life [22].

Inclusion of students with special needs into the regular classroom is on the rise. Intervention programs including physical activity are avenues that could be used for successful inclusion. A review of studies examining the relationship between physical activity and students with special needs showed that different interventions programs were implemented. Results indicated a decrease of behavioral problems in children with attention deficit hyperactivity disorder, an improvement in reading and semantics in children with reading disabilities, and an increased focus on expected tasks in children with emotional and behavioral disorders [22].

5. Teacher Preparation Programs

The information on the current health status of Omani children needs to be imparted to university students graduating in physical education and to health professionals in the field through inservice training. Teacher Preparation Programs should include among other things content knowledge about physical education, planning developmentally appropriate units, using teaching methods that involve diverse learners, and assessing physical education and its contributions to the physical, social, cognitive, and emotional domains [23].

6. Recommendations

The physical activity level of the Omani child is dependent on the availability of opportunities to engage in such activities. Given the shortage in facilities, schools present the most appropriate medium to reach the highest percentage of the new generation and their families. Starting with basic education is ideal. This suggestion is supported by the fact that around 25% of the population is between 5 and 15 years old and their parents would be among the 56% of the population between 15 and 49 years old. Steps are recommended as follows: first, there is a need to analyze the effectiveness and efficiency of the available physical education lessons in basic education; second, to include physical education in an integrative manner in the curriculum wherever possible; third, to combine nutrition, health, and physical information in a meaningful manner; and fourth, to conduct studies on the effectiveness of adding sports components to the curriculum.

Implementing physical education in Omani basic education is by no way a luxury. It is a necessity if the new generation is to adopt a physically active lifestyle and decrease its odds of developing NCDs.

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