BABEŞ-BOLYAI UNIVERSITY OF CLUJ-NAPOCA

FACULTY OF PHYSICAL EDUCATION AND SPORT

THE DOCTORAL SCHOOL OF
PHYSICAL EDUCATION AND SPORT

THE EFFECT OF CURRICULUM BASED PHYSICAL ACTIVITY AMONG ISRAELI UNIVERSITY COLLEGE STUDENTS

SUMMARY

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INTRODUCTION

This research conducted at an engineering college in Israel. ***Gap in Knowledge: Research Problem:*** Since the establishment of the first university in Israel, sports units set up as part of university life and a requirement for graduation. In the 1990s, Sports programs at universities cancelled, and today only two academic centers, have sports centers engaging in physical activity as a mandatory subject within engineering students' curriculum. No research been conducted in Israel examining perceptions of the significance of physical activity and a healthy lifestyle among college students.

Significance of the Topic: Researchers in the domain of health promotion have regarded university campuses as worthy grounds for promoting numerous educational causes. Universities, such as Oxford and Cambridge, have taken responsibility for educating students as part of their philosophy (Zilberman et. al., 2005; Irwin, 2007). Promoting health via physical activity is of great significance as students, during their university studies, reduce their physical activity and engage in sedentary behavior (Behrens & Dinger, 2003; Buckworth & Nigg 2004; Sinclair, et al, 2005; Keating et. al., 2005).

Research Aim

The aim of the research was to observe and assess the attitude of the students and the decision makers of a technological college in the North of Israel towards practicing physical activities during the academic training and the effect of a physical activity program on the students' physical fitnes.

PART I. LITERATURE REVIEW

CHAPTER 1: THEORETICAL FOUNDATION OF THE RESEARCH

In the literature review, we intend to show in-depth investigations and clarify concepts in the field of sport and physical activity. The chapter will be composed of World health and physical activity, Theory for promotion of health and Physical activity among college student.

1.1. One of the Theories Underpinning this Research

In this research, we focus on holistic perceptions and beliefs. It based on a four diverse theories: sociological theory - health promotion for healthy lifestyle; sociological and psychological theory - physical activity, motivation promotion; sociological theory - promoting a sense of belonging; organizational theory - values promotion.

- ***Antonovsky's Salutogenic Model – for the Promotion of Health***

The Salutogenic orientation offered as a basis for the development of theories in the field of health promotion. It focuses on the causes of health instead of focusing on risk factors. The reference is to human beings in general, all over the ease/disease continuum, and not to specific at-risk groups (Amda & Anson & Sagy, 1998).

1.2. World Health and Physical Activity

Millions of people die each year because of being overweight or obese, and an estimated 35.8 million (2.3%) of global, DALYs (Disability-Adjusted Life Year) caused by being overweight or obesity. Being overweight or obese leads to adverse metabolic effects on blood pressure, cholesterol, triglycerides and insulin resistance. Risks of coronary heart disease, ischemic stroke and type 2 diabetes mellitus increase steadily with increasing body mass index (WHO, 2013).

One study conducted in 2005 found that in the U.S. there is almost no physical activity intervention programs in higher education. Students are tomorrow's leaders, and if they do not engage in physical activity, they will not, as leaders, promote a healthier lifestyle in organizations they may lead (Keating, & others, 2005).

The revolutionary new science of mind and body training – 'Spark' by Ratey and Hagerman (2010) reported that physical activity improves learning, students' reading ability and achievements in more subjects being taught. Exercise encourages brain cells to bind to

one another. Many students not exposed to levels of physical activity as recommended by the Center of Disease Control and Prevention (Pate, et. al, 1995; Kilpatrick, et. al, 2005; Soyeur et. al. 2010; Downs & Ashton, 2011).

1.3. The association between Physical Activity and different life domain related to health promotion among Colleges and Universities students

The Research literature presents an extensive body of knowledge regarding the implications of Physical Activity on many human life domains.

1.3.1. Implications of Obesity, Physical Activity and Proper Nutrition on Physical Health

Obesity is the number 1 disease in the U.S. Since the data reveal obesity among students, campuses must engage in intervention to promote physical activity and a healthy lifestyle among students. Research that conducted by Ross (2000) in medical students found that proper nutrition is of great significance to one's health.

Suminski et al, (2002), Buckworth & Nigg, (2004) and Sinclair et al (2005) studied college students in the U.S. and in the western world and examined the differences between physical activity among active students and those who are sedentary.

1.3.2 Mental Health Risks and Physical Activity

Nguyen-Michel et. al. (2006) and Downs & Ashton, (2011) reported that college students develop high risk of mental disease. In 2008, a research was conducted which found that 53% of the BA students reported mental problems.

1.3.3 Students' Risk Factor Related Behavior Alcohol Consumption, Drug Abuse and their Association with Physical Activity

Dunn & Wang, (2003), Irwin, (2007), and Seo et al, (2007) reported that 87% of the students experienced alcohol consumption; 43% smoked and 17.7% smoked marijuana, 3.4% had tried cocaine in the year before the research. It was found that physical activity intervention and sports teams in the universities influence a decrease in smoking, drug abuse and alcohol consumption.

1.3.4 The Students Perceptions of their Academic Achievements and Physical Activity

Downs & Ashton (2011) reported that more than 44% of the students believe their grades have much to do with their mental state of health, and that mental weakness and stress

characterize students in their first year in college. The conclusion was that physical activity intervention programs have to be introduced in colleges so as to promote students' mental health and academic achievements.

1.3.5. Access to Sports Facilities

Researchers suggest that proximity to sports facilities in the campus constitute an attracting force and increases students' motivation to engage in physical activity. (Keating et. al., 2005; Phillips, 2005)

1.3.6. Gender Differences

Suminski et. al. (2002) found that women are less active than men over the weekend. Keating et. al. (2005) added that students' behavior pertaining to physical activity and it was found that effectiveness is the female students' top reason for engaging in physical activity, and a student that is more effective can promote health better.

1.4. Mandatory Physical Education in Colleges and Universities in the USA

Professor Brad Cardinal from Oregon State University (USA) said, "*We can see more evidence about the benefit of physical activity, not just to our bodies, but to our brain, yet educational institutions are not embracing their own research.*" (Klampe, 2013).

PART II. PILOT RESEARCH

CHAPTER 2: PHYSICAL EDUCATION AT THE UNIVERSITY CURRICULUM

2.1. The purpose of the Pilot Research

The research was performed before the research was conducted as Creswell, (2009) and Bryman, (2012), described in their studies and their books.

The aim of the pilot research stage was to examine whether **students** and the **policy makers** in a college will participate in a research, and whether the questions in the questionnaire were clear.

2.2. Objectives

The main objective of the pilot research stage is finding the opinion of students and university decision makers about the need to introduce Physical Education as compulsory education; Check whether the research tools collect in a proper way the information from the subjects.

2.3. Questions

- What is the opinion of the students abouhet the Status of Physical Education in College?
- What is the opinion and the presumption of College Decision makers about the Physical Education status?

2.4. Subjects and Methods

Randomly we selected 20 students (10 male and 10 female) and 4 of the decision makers at the College. The 20 students have been completed a questionnaire and physical measurements and tests. In addition, the Four decision makers were interviewed and asked in semi-open interview for decision makers.

Table 1: Characterization of the subjects

Gender		N	Minimum	Maximum	Mean	Std. Deviation
Male	Age	10	18	29	24.40	±2.875
Female	Age	10	22	26	23.80	±1.398

Table 2: Theme, Categories and Sub-Category from the Four Decision makers

Theme	**Decision makers acknowledge the significance of education for a healthy lifestyle within universities and colleges**
Categories and Sub Categories	Category No. 1: Last Chance for Physical Education
	Category No. 2: Chance for Spreading the Message of the Importance of Physical Activity Sub-Category: Tomorrow's Leaders
	Category No. 3: Physical Activity as Mandatory Program in College
	Category No.4: Integrated Physical Activity as Prestige to the University Sub-Category: To Set an Example for Other Academic Institutions

2.5. The conclusion emerged from the qualitative pilot research

The conclusions that raised from the pilot regarding the pilot aim and the question:

- **The aim of the pilot stage** was to examine whether **policy makers** in a college will participate in a research, and whether the questions in the in interviews were clear.

The decision makers collaborated; Questions have understood and the results pointed out the various opinions, which may indicate the importance of the issue of promoting a healthy lifestyle among students at the Academy.

2.6. The conclusion emerged from the pilot quantitative research

The pilot aim was "To examine whether students in a college will participate in a research, and whether the questions in the questionnaire were clear."

The conclusions emerging from the results: is that we must examine the occurrence of a healthy lifestyle among students more thoroughly. In addition, quantitative research tools were excellent data collection tool.

The students in a college will participate and will collaborate in a large research; the questions in the questionnaire were clear to them.

PART III PERSONAL RESEARCHS REGARDING THE EFFECT OF CURRICULUM BASED PHYSICAL ACTIVITY AMONG ISRAELI UNIVERSITY COLLEGE STUDENTS

CHAPTER 3: Methodology: Mixed Methods Research (Creswell, 2011)

This an experimental and social research, there is an aspect of the researcher understanding of what goes on in society that is to some extent unresolved (Bryman, 2012).

3.1. Research Aim

The aim of the research was to observe and assess the attitude of the students and the decision makers of a technological college in the North of Israel towards practicing physical activities during the academic training and the effect of a physical activity program on the students' physical fitnes.

3.2 Research Objectives

The main research objective was to assess the effect of a physical activity program on the students' physical fitness and lifestyle.

The study aimed at the following secondary objectives:

- To assess the extent to which the intervention program affect students' physical fitness.
- To verify whether different types of physical activity influences physical mesurement investigated.
- To examine whether the intervention program affects the students' perception of physical activity.
- To examine the students' perceptions of the influence of a physical activity intervention program on their healthy lifestyle.
- To explore the students' motivation to participate in physical activity at the college.
- To examine the policy makers' perceptions of incorporating an intervention program (based on physical activity) into educational curricula.

3.3 Research Hypotheses

The literature shows the beneficial effect of physical exercises on the health of people, in general, young people in particular. Numerous research findings have revealed the benefits of regularly practiced physical activities on the health of people of different ages, resulting in increasing work efficiency too. The risks faced by sedentary individuals as a result of physical inactivity also are highlighted. This study is based on the following assumptions:

- By regular practicing, physical exercise improves the students' physical condition;
- The amount of physical indicators is influenced by the type of physical activity conducted;
- Including physical education as a compulsory subject in the curricula can increase the number of the students who will regularly practice physical activities and this will change their attitude towards a sedentary lifestyle;

3.4. Research Questions

Quantitative questions

- Dose the intervention program affect the Engineering College students' physical fitness?

- Does the amount of physical indicators influence the type of physical activity conducted?
- Dose the intervention program affect the Engineering College students' perceptions about physical activity?

Qualitative question

- What are the Engineering College students' perceptions of the influence of physical activity intervention program on their healthy lifestyle?
- What motivates Engineering College students to participate in physical activity in the college?
- What are the Engineering College policy makers' perceptions of incorporating the intervention program (based on physical activity) into educational curricula?

3.5. Hypothesis

- The physical fitness among Engineering College students will improve after participating in the intervention program.
- The amount of physical indicators will be influenced by the type of physical activity conducted.
- The Engineering College students' perceptions about physical activity and exercise will positively influenced by participating in the intervention program.

3.6. Research Design

After the results from the preliminary research, we planned the main research that was conducted to Three main stages, as Bryman, (2012) and Creswell (2009), described in their studies and their books.

a. ***Stage 1:*** Pretest quantitative research and 'Intervention Program', beginning of first semester in October 2012.
b. ***Stage 2:*** Posttest quantitative research, end of the semester, the end of January 2013.
c. ***Stage 3:*** Qualitative research, from February 2013 until the end of the year 2013.

The questionnaire was built from five categories: A. Physical Activity; B. Risk Factors: General health and mental health status, Smoking, Alcohol Consumption, Drug Use; C. Emotional and Life Satisfaction; D. TV viewing habits and computer; E. Eating and drinking habits. In addition, the students were measurements in five physical measurements and physical tests at the beginning and in the end of the first semester of 2012.

Table 3: Methodology: Mixed Methods Research: Stage, Tools, Subjects, Analysis

Stage	Research Aim	Research tool	Research Subjects	Analysis
Stage I & Stage II: Quantitative Research	Collecting data and analysis (Pretest and Posttest) To understand the students' attitudes and thinking patterns regarding physical activity in general and curriculum based physical activity in particular	First time: Questionnaire & Physical Tests Research & Control Group	**Research G.353\204** Male (N=141) Female (N=63) **Focus Group 45** Male (N=33) Female (N=12)	Statistics analysis With SPSS and Paired Samples T-Test Anova
		Second time: Questionnaire & Physical Test Research & Control Group	**Research G.291\204** Male (N=141) Female (N=63) **Focus Group 45** Male (N=33) Female (N=12)	
Stage III: Qualitative Research	Collecting data and analysis with Qualitative tools In order to strengthen the research get the validity and develop new theory	Interviews And 'Focus Group'	14 Decision Makers	Content analysis for emerging Categories and Themes
			15 Students 'Focus Group'	

CHAPTER 4: RESEARCH RESULTS

Chapter No. 4 discuss the results of the quantitative and qualitative research that include the results of physical measurements, additionally, the result of the questionnaire that we after apply to the experimental group and control group, males and females.

4.1. Quantitative Results: Physical Test and Measurements

Paragraph 4.1 reveals the results of 'Experimental Group' and 'Control Group' Pretest and Posttest. The physical test and measurements

Result No. 1: Improving Physical Fitness

Because of the intervention program based on physical activity, the research results show improvement in physical measurements and physical fitness using the Ruffier Test, Sit-Up Test and Skin Folds measurement, Fat percentage, Fat Index.

Table 4: Male Paired Samples T-test 'Experimental Group' pretest and posttest (N=141)

Paired Samples T-test[a]									
		Paired Differences					**t**	**df**	**Sig. (2 tailed)**
		Mean	**Std. Deviation**	**Std. Error Mean**	**95% Confidence Interval of the Difference**				
					Lower	**Upper**			
Pair 1	BMI1 - BMI2	-.10722	.89882	.07543	-.25633	.04190	-1.421	140	,157
Pair 2	**Ruffier 1 Ruffier 2**	**2.64120**	**4.00483**	**.33608**	**1.97679**	**3.30560**	**7.859**	**140**	**.000**
Pair 3	**Sit-Up 1 Sit-Up 2**	**-17.021**	**27.307**	**2.292**	**-21.551**	**-12.491**	**-7.428**	**140**	**.000**
Pair 4	Flexibility 1 Flexibility 2	-.877	8.115	.681	-2.223	.469	-1.288	140	.200
Pair 5	**Skin folds 1 Skin folds 2**	**10.303**	**13.241**	**1.111**	**8.106**	**12.500**	**9.272**	**140**	**.000**
Pair 6	**Fat Percentage 1 Fat Percentage 2**	**2.34648**	**3.00741**	**.25238**	**1.84755**	**2.84541**	**9.298**	**140**	**.000**
Pair 7	**Fat index 1 Fat index 2**	**.577**	**1.013**	**.085**	**.409**	**.745**	**6.794**	**140**	**.000**

Paired Samples T-test[a] - Analysis of the table 6 presenting the physical measurements for the experimental group (N=141) – male - reveals the following: (The bold in tables 4 represent significant results).

Regarding the results of the physical measurements and test: (Male Paired Samples T-test for male), The mean age was 25.10 (±2.85), after applying the T-test, it was found that, BMI and Sit and Reach Test (Flexibility), because the value of Sig. is high (> 0.05) – respective 0.157 and 0.200 – differences between the means of the measurements pretest and posttest, were not significant. Instead, for the Ruffier Test, Sit-Up Test, Skin Folds, Fat percentage, Fat % Index, the differences between means were significant because the value of Sig. associated with the *t*-statistic is small (<0.05). Regarding measurements of BMI and Flexibility, there was no statistical significance. The reason probably that we keep experimenting value only 4 months of activity and it was difficult to improve flexibility and body mass index for such a short time.

1. Ruffier Test (Ruffier1 - Ruffier2)

This test indicated an improvement between the first and the second measurement by 2.64120. The pretest mean result was 10.9338 whilst in the posttest the index decreased and revealed an improvement – 8.2926 (Index value of 7.1-7.2 is good).

2. Sit-Up (Sit-Up 1 – Sit-Up 2)

This test indicated an improvement in results between the first and second measurement – an improvement of 17 sit-ups.

3. Skin Folds (Skin Folds 1 - Skin Folds 2)

The result indicated a mean improvement of 10.301 mm from a mean measurement of 55.08 to a mean measurement of 44.78.

4. Fat Percentage (Fat Percentage 1 - Fat Percentage 2)

The difference between the first and the second measurement indicated a significant improvement of 2.34648 from 19.3521% in the pretest to 17.0056% in the posttest, showing a decrease in body fat percentage.

5. Fat Index (Fat Index 1 - Fat Index 2)

The result reveals an improvement in fat Index from 0.577 in the pretest to 2.99 in the posttest.

Table 5: Female Paired Samples T-test 'Experimental Group' Pretest and Posttest

Paired Samples T-test[a]									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	BMI1 - BMI2	-.09265	.98838	.12452	-.34157	.15627	-.744	61	.460
Pair 2	**Ruffier 1 Ruffier 2**	**2.80381**	**4.36367**	**.54977**	**1.70483**	**3.90279**	**5.100**	**61**	**.000**
Pair 3	**Sit-Up 1 Sit-Up 2**	**-8.794**	**18.434**	**2.322**	**-13.436**	**-4.151**	**-3.786**	**61**	**.000**
Pair 4	Flexibility 1 Flexibility 2	-1.310	6.353	.800	-2.909	.290	-1.636	61	.107
Pair 5	**Skin folds 1 Skin folds 2**	**11.429**	**13.569**	**1.710**	**8.011**	**14.846**	**6.685**	**61**	**.000**
Pair 6	**Fat Percentage 1 Fat Percentage 2**	**2.76825**	**4.11636**	**.51861**	**1.73156**	**3.80495**	**5.338**	**61**	**.000**
Pair 7	**Fat index 1 Fat index 2**	**.730**	**1.194**	**.150**	**.429**	**1.031**	**4.853**	**61**	**.000**
a. Gender = 2									

Paired Samples Test[a] **-** Analysis of the two tables presenting the physical measurements for the experimental group (N=62) – female - reveals the following: (The bold in table 5 represent significant results).

For female: the mean age was 23.36 (±a2.19). After applying the T-test: it was found that BMI, and Sit and Reach Test (Flexibility).

1. ***Ruffier Test (Ruffier1 - Ruffier2)***

This test indicated an improvement between the first and the second measurement by 2.80381.

2. Sit-Up (Sit-Up 1 – Sit-Up 2)

This test indicated an improvement in results between the first and second measurement – an improvement of 8.794.

3. Skin Folds (Skin Folds 1 - Skin Folds 2)

The result indicated a mean improvement of 11.429 mm from a mean measurement

4. Fat Percentage (Fat Percentage 1 - Fat Percentage 2)

The difference between the first and the second measurement indicated a significant improvement of 2.76825% from 27.431% in the pretest to 24.669% in the posttest, showing a decrease in body fat percentage.

5. Fat Index (Fat Index 1 - Fat Index 2)

The result reveals a 0.730 improvement in fat Index from 4.30 in the pretest to 3.57 in the posttest.

Further in the thesis we can see the analysis of the results by gender subgroups subjects of the experiment. Table No. 8 shows the structure of the gender.

Table 6: Structure of Experiment Subgroups by Gender

Subgroup	Male	Female	Total
1: Physical Education lesson	78	22	100
2: Ball Games	32	3	35
3: Physical activity mattress	14	20	34
4: Cardio exercise	17	18	35
Total	141	63	204

4.2. Qualitative Results

This chapter presents the qualitative results research results: results emerging from a focus group of 15 students from the college, and 14 interviews with the college's decision makers. The data analysis conducted by using content analysis, identifying the common categories that the participants raised. Major themes arose from the categories, and those will constitute the summary of this chapter.

Table 7: Results Emerging from the Qualitative Research: Theme, Categories and Sub-Categories from the 15 Engineering Students: 'Focus Group'

Theme	**Ambivalence: Understanding the Significance of Physical Activity in its Health Aspect versus Acknowledging Engineering Students Difficulty in Engaging in Physical Activity on a Regular Basis**
Categories and Sub-Categories	**Category No. 1: Significance Attributed to Physical Activity** **Sub-category: Physical Activity for pleasure (games) and awareness** ***A. Student****: "It appears that from a young age, there is no awareness that sport isn't just fun and enjoyment; in school they gave us a ball and we were told to play, we weren't educated for health*". ***O. Student****: "Right here in the college they raise and expose the awareness of physical activity.*
	Category No. 2: Physical Activity as a Program in College: **A well planned and organized physical activity in college** ***C. Student****: "It's quite important to have a physical activity intervention program for students, because without an organized program it will not be possible to progress in achieving the goals of physical education.*" **Physical activity as a mandatory part of the curriculum**: ***V. Student****: "I think that everything in life ought to be planned, especially when you're a student, otherwise everything becomes a mess; I feel good about the sport intervention because there is order and physical activity becomes a part of an organized, permanent schedule.*"
	Category No. 3: The influence of physical activity **Sub-Category: Promotion of Grades and Studying:** **V. Student**: "*Physical activity is very important; it helps me stay more alert and function better during my studies and in my daily life.*" **Sub-Category: Reducing Chance of Disease:** **V. Student**: "*Without physical activity the body isn't immune to diseases and it increases the chance of becoming ill – especially Cancer.*" **Sub-Category: Reducing Chance of Abusing Substances:** **V. Student:** *"Drugs destroy the muscle, alcohol and cigarettes destroy the muscle and the functional body systems; they cause physical and mental deterioration, and can possibly influence behavior. They destroy health.*"

	Sub-Category: Promoting Physical Health: **P. Student:** "*I perceive physical activity as investing in myself, because I feel that when I exercise I'm healthier, I feel better about myself."* **Sub-Category: Promoting Mental Health:** *A. Student: "In my opinion, sport and physical activity reduce stress in college, causes alertness and suppresses mental and spiritual exhaustion.*"
	Category No. 4: The Gap between Awareness and Implementation: P. Student: "*I do not agree. Ask anyone and he will surely tell you that everyone is aware of the importance of physical activity and sports. 90% understand the importance but don't do physical activity*".

Table 8: Theme, Categories and Sub-Category from the 14 Decision makers

Theme	**Decision makers strongly and profoundly acknowledge the significance of education for a healthy lifestyle within universities and colleges**
Categories and Sub-Categories	**Category No. 1: Last Chance for Physical Education:** "*Since we are dealing with students in a critical age, when all he receives in life is being scorched inside him, it's a chance that the students are in instructive and educational framework.*"
	Category No. 2: Chance for Spreading the Message of the Importance of Physical Activity. **Sub-Category: Tomorrow's Leaders:** "*It's necessary to implement an intervention program in colleges and universities; The program's influence may be critical for a healthier future of the country*."
	Category No. 3: Physical Activity as Mandatory Program in College; "*Yes, it's right to implement a sports intervention program in colleges and universities… Sports curricula should be included as an obligation within academic curricula*."
	Category No.4: Integrated Physical Activity as Prestige to the University; **Sub-Category: To Set an Example for Other Academic Institutions:** "*Our college can show a good example to other institutions with the physical activity intervention program*."

	Category No.5: Saving for the State's Economy: "*Healthy lifestyle studies… educating for preventative medicine and reduction of diseases, hospitalizations, surgery and medications. Saving sick days, less dealing with disabled, invalid people influences the state's economy*."
	Category No.6: Part of General Education: "*Our college has engaged in developing physical activity as part of general education, since it's foundation to this day, I as the College President, support initiative and the development of varied activities for students and staff*."
	Category No. 7: Significance of Physical Activity as Seen by the College Decision Makers. **Sub-Category: Physical Activity as Part of Daily Life:** *Physical activity is scheduled regularly into the schedule...it helps a person in his daily efforts, helps the person function when he or she encounters rigorous strain in his life*." **Sub-Category: Physical Activity from General Social Perspective: Tools for Life.** *College is an educational academic institution that is entrusted not only to offer engineering training, but also to provide tools for life.*" **Sub-Category: Physical Activity Defines the Person,** "*Because students' are tomorrow's leaders*." **Sub-Category: State Goals: "***When the declared level to which all must comply is that physical activity is important, then this must find expression in each level of education through which an Israeli citizen passes; school until the age of 18, the military framework: 3 years for men and 2 years for women, academic studies in colleges or universities."*

CHAPTER 5: DISCUSSION AND CONCLUSION

Following the Results chapter, the Discussion and Conclusions chapter will discuss the results in the context of the research questions, explain and interpret the findings, connect them to the literature, and finally draw conclusions.

5.1. Discussion of Results Related to Research Question Number 1 and 2.

- Dose the intervention program affect the Engineering College students' physical fitness?
- Does the amount of physical indicators influence the type of physical activity conducted?

Finding No. 1: Improving Physical fitness, and the different types of physical activity subgroups influencing the participants' physical fitness.

The conclusion emerging from the discussion of the first result is that there has been an improvement in physical measurements and physical fitness regard to the research topic. An intervention program, set within a curriculum based on physical activity, improves and promotes physical measurements and physical fitness among students.

5.2. Discussion of Results Related to Research Question Number 3

- "Dose the intervention program affects the Engineering College students' perceptions about physical activity?"

Following an intervention program based on physical activity in the college:

- The number of students who are physically active on a regular basis increased.
- The main factor for improvement in mental measurements was an intervention program based on physical activity that was fixed, consistent, and allowed every student who was physically active to relieve stress and anxiety while exercising.
- Women, in particular in both the experimental and the control groups, found the issue of body weight to be very important.
- There was a reduction in consumption of alcohol and smoking among students.

The literature supports the result: Suminski et. al., (2002); Buckworth & Nigg, (2004) and Sinclair et. al. (2005) studied college students in the U.S, the studies found that 78% of American students sit a lot and their level of activity was way below the recommended level of activity for improving health.

Consistent and regular physical activity in academic institutions is meaningful and necessary for reducing tension and stress. Physical activity contributed to health promotion and proper weight (Seo et. al 2007, 2009).

Nguyen-Michel et. al. (2006) and Downs & Ashton (2011) reported that college students develop high risk of mental disease.

An intervention program based on physical activity in a curriculum perceived as reducing smoking and alcohol consumption. Physical activity intervention and sports team's universities influence a decrease in smoking, drug abuse and alcohol consumption (Downs & Ashton, 2011).

5.3. Conclusions and Recommendations

This chapter presents the factual conclusions in the context of physical activity as an integral part of an academic curriculum with reference to the research questions, thus answering them. The conclusions will present in the order of the discussion and research questions. In addition, conceptual conclusions will presented and a model will introduced recommending how a sports unit in college or university ought to operate. The significance of the model of physical activity based academic curriculum will be explained - a program with the rationale of social life in an academic institution. The chapter will present the practical implications of the recommendations, research limitations and contribution to knowledge.

This research found that physical activity as part of a curriculum in academic institutions is an ambiguous, inconclusive, and ambivalent process. The intervention improved physical measurements and physical condition among the students, as well as progress in behavior and regulation patterns of physical activity as an integral part of the students' daily life; it shed light on the importance of physical activity among students and thus increased the number of students who were physically active on a regular basis. It reduced tension and stress, and has been a significant factor in students' attitudes toward weight loss. It found that a physical activity based intervention program promoted physical and mental health, thus helping students cope with intense, challenging and difficult academic assignments, passing exams and obtaining better grades. Physical activity reduced risk factors such as smoking and alcohol consumption, eating at restaurants and food stalls and promoted a "health promotion" worldview and approach.

Good communication among all parties in the academic institution, led to effective and meaningful dialogue. Understanding that health promotion on campus is significant to all parties. Decision-makers, students, and in fact, the program has been a bridge to the ambivalence in the academic world: students, study many hours within a structured curriculum in the academic institution and double these hours at home, which does not allow most of them to engage in leisure physical activity. The intervention program has constituted a bridge to quality physical activity and health promotion time, has been accessible and perceived as play, as a light, refreshing part and stress relieving part of a difficult and intensive schedule at the college. Furthermore, the intervention program was perceived as "physical activity for awareness" and as a warning sign for lack of physical activity and sedentary behavior.

The Decision Makers at the researched college regarded a physical activity based intervention program within the academic curriculum as important. They perceived it as having social value to share with society by students as future leaders. The program provided an opportunity to represent the country in international sports events and be a source of pride for the country and an academic institution that fosters physical activity as a healthy lifestyle. A physical activity based curriculum improved the image, prestige and reputation of colleges and universities, and set an example for others. In this way, this intervention program also served as an effective marketing strategy for attracting students to the academic institution.

In conclusion: Physical activity based intervention program can be a source of inspiration, motivation and significant exposure to an environment of sport and varied physical activity that offers. Opportunities to students who had not previously engaged in physical activity and those who have been physically active, to engage in physical activity on a regular basis, or to start a new way of promoting physical and mental health with all the advantages mentioned earlier. Therefore, this research recommends that physical activity integrated into an academic curriculum.

5.4. Recommended Model of a Physical Activity Based Intervention Program within an Academic Curriculum and Its Practical Implications

The model based on a genuine and meaningful dialogue between students, decision-makers and sports personnel in academic institutions, as well as on theories, research in the field of physical activity among students. The intervention program need to emerge from the field. From students and decision-makers, after reaching a consensus on the necessity of an intervention program, and the acting forces realize that an intervention program seeks to bridge

a gap in knowledge in academic institutions regarding the promotion of physical and mental health and the many benefits an intervention program offers to the students.

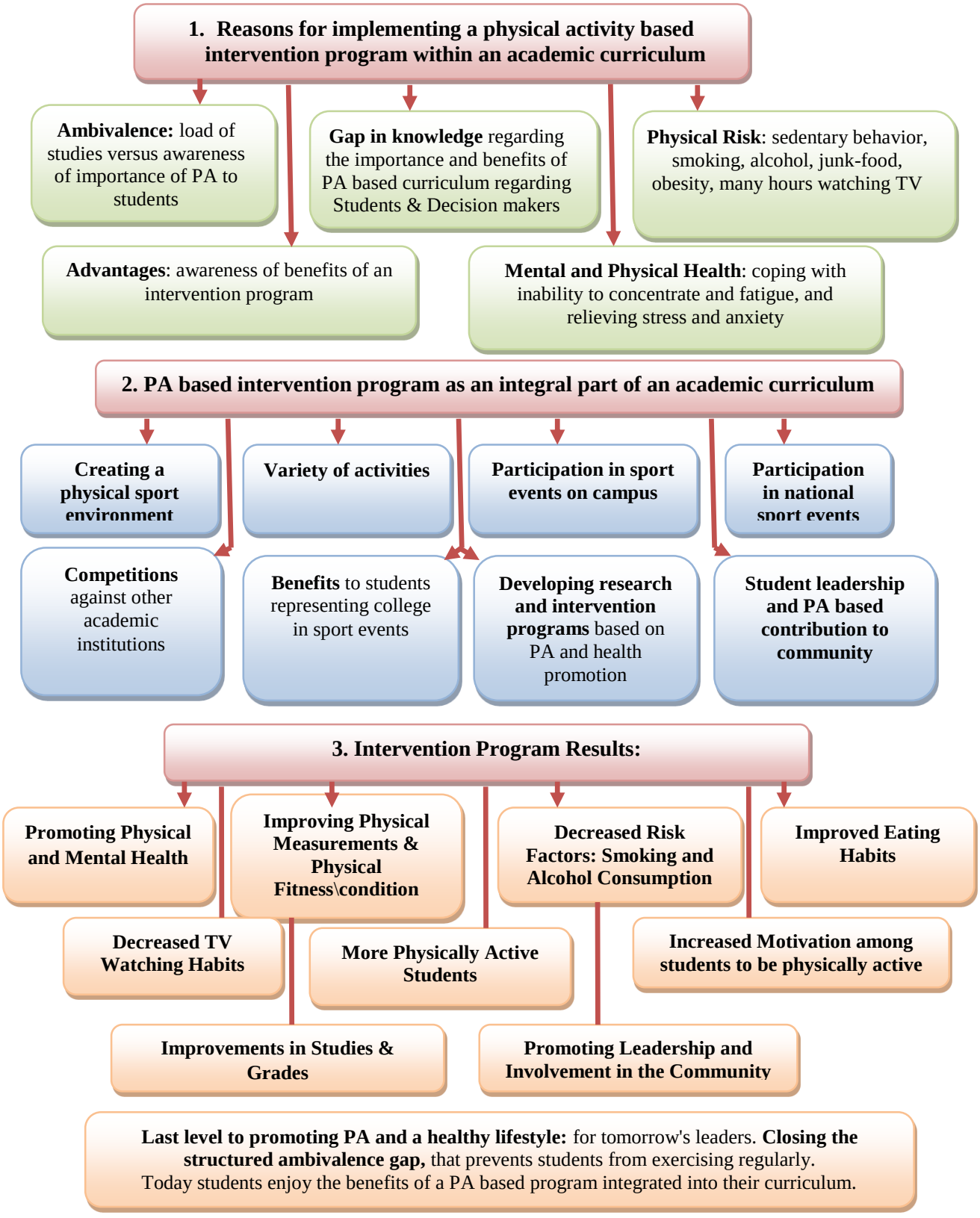

Figure 1: The proposed model for integrating PA into a curriculum as an integral part of academic studies

5.5. Contribution to Theoretical and Practical Knowledge

The contribution of this study to theoretical knowledge resides in the fact that this is the first study to explore the effect of a physical activity based intervention program on behavioral patterns among college students in Israel. Thus, the model that emerged from this research can contribute to knowledge in four domains, i.e., physical activity as an integral part of the academic curriculum; theory of healthy lifestyle (Antonovsky, 1998; Mahoz & Stanly, 2003) that is facilitated by physical activity, at a critical point in the life of young Israelis; theory of organizational development management (Dolan, Garcia, Landau, 2007); and physical activity in Israeli academia as a means of living a healthier life.

5.6. Future Research

The researcher together with three others at the College is conducting research to evaluate whether physical activity within an academic curriculum affects the brain and the functioning of students with ADHD.

REFERENCES

Behrens, T. K., Dinger, M. K. (2003). A Preliminary Investigation of College Students Physical Activity pattern. *American Journal of Health Studies, 18(2/3), PP. 169-172*: USA.

Bryman, A. (2012). Social Research Methods, (4th edition). Pp. 633-634, Oxford University Press Inc.: New York.

Buckworth, J. & Nigg, C. (2004). Physical Activity, Exercise and Sedentary Behavior in College Students. *Journal of American College Health*, Vol. 53, No. 1, PP. 28-33: USA.

Creswell, J. W. (2009). Research Design, Qualitative, Quantitative, and Mixed Methods Approaches (Third Edition). Pp. 4; 204-205. SAGA Publications, Inc. London: United Kingdom.

Creswell, J. W. Plano Clark, V. L. (2011). *Designing and Conducting Mixed Methods Research*. Second Edition. SAGE Publications, Inc. USA.

Dolan, L. S., Garcia. S. & Landau, A. (2007). *Management by Values, Passional, emotional, ethical, economic*. Globes Liberary: Israel (Hebrew).

Downs, A. & Ashton, j. (2011). Vigorous Physical Activity, Sport Participation, and Athletic Identity: Implication for Mental and Physical Health in College Students, *Journal of Sport Behavior, Vol. 34, No. 3, pp. 228-249*: USA .

Dunn, M. S., & Wang, M. Q., (2003). Effects of Physical Activity on Substance Use among College Students. *American Journal of Health Studies: 18(2\3)*: USA .

Irwin, J. (2007). The Prevalence of PA Maintenance in a Sample of University Students: A Longitudinal Study. *Journal of American College Health, Vol. 56, No. 1, Pp. 37-41*: USA .

Kilpatrick, M., Hebert, E. & Bartholomew, J. (2005) College Students' Motivation for Physical Activity: Differentiating Men's & Women's Motives for Sport Participation and Exercise, *Journal of American College Health, Vol. 54, No. 2, 87-94*: USA .

Klampe, M. (2013). Physical education requirement at four-year universities at all-time low. News & Research Communication. *http://oregonstate.edu/ua/ncs/archives/2013/jan/physical-education-requirement-four-year-universities-all-time-low-according-study. (12.3.14).*

Keating, X. D., Guan, J., Pinero, J. C., & Brides, D. M. (2005). A Meta-Analysis of College Students' Physical Activity Behavior. *Journal of American College Health, Vol. 54, No. 2:* USA.

Nguyen-Michel, S. T., Unger, J. B., Hamilton, J. & Spruijt-Metz, D. (2006). Association between PA & Perceived Stress\Hassles in College Students. *Stress and Health*, 22: 179-188: USA .

Pate, R. R., Pratt, M., Blair, S. N., Haskell, W. L., Macera, C.A., Bouchard, C., Buchner, D., Ettinger, W., Heath, G. W., & King, A. C., et al. (1995). *Physical activity and public health, a recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine*. JAMA: USA.

Ratey, J. & Hagerman, E. (2010). Spark: The Revolutionary new Science of Training the Body and Mind. Kinneret, Zmora-Bitan, Dvir-Publishing House Ltd. Or Yehuda: Israel (Hebrew).

Ross, E. M. (2000). Preventive nutrition and Physical Activity: an exercise in interviewing for medical students. *Nutrition in Clinical Care, Vol. 3, pp. 324-333*: Boston University, Massachusetts.

Seo, D. C., Nehl, E., Agley, J. & Ma, S. S (2007) Relations between PA and Behavioral and Perceptual Correlates among Midwestern College Students. *Journal of American College Health, Vol. 56, No. 2, pp. 187-197*: USA.

Sinclair, K. M., Hamlin, M. J. & Steel, G. D (2005) Physical Activity Levels of First-Year New Zealand University Students. *Youth Studies Australia, Vol. 24, n. 1, pp. 38-42:* Australia .

Soyeur, F., Unala, D. & Elmali, F. (2010) the relationship between PA level and fatigue in vocational college students, *International SportMed Journal, Vol. 11 No. 3, pp. 345-355* .

Suminski, R. R., Petosa, R., Utter, A. C. & Zhang, J. J. (2002) Physical Activity among Ethnically Diverse College students, *Journal of American College Health, Vol. 51, No. 2. pp. 75-80*: USA.

World Health Organization (2013). Global Health Observatory (GHO), Mean Body Mass Index (BMI). *http://www.who.int/gho/ncd/risk_factors/bmi_text/en/.(20.5.2013)*.

Zilberman, I., Guri-rosenblit, S., Solomon, G., Scher, I. & Frank, M. (2005). Academic Teaching, Education or Imparting Knowledge? Discussion. *Al Hagovah, Higer Education teaching Magazine, 4 p. 25*. (Hebrew.)