



## THE DIFFERENCES IN PHYSICAL ACTIVITY LEVELS OF MALE AND FEMALE UNIVERSITY STUDENTS

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### Abstract

**Study purpose.** The aim of this study was to examine the levels of physical activity among undergraduates living in ADISU (Agency for the Right to University Study) residences in order to better understand their situations and highlight the differences between male and female students.

**Materials and methods.** Eighty participants between the ages of 18 and 28 were enrolled in this study. A questionnaire was given to each participant who was selected for the study in order to gather general data and measure physical activity levels.

**Results.** 60% of the students involved in this investigation are smokers; nonsmokers show a higher average than smokers, which indicates greater physical activity and higher frequency; 52.3% of female students declare not to practice any PA compared to 26.9% of male students; 9.3% of female students declare to practice PA < 1 time per week, while 15.4% of male students declare to practice PA < 1 time per week; 7.4% of female students declare to practice PA 1-2 times per week, while 3.8% of male students declare to practice PA 1-2 times per week; 25.9% of female students declare to practice PA 2-3 times per week, while 23.1% of male students declare to practice PA 2-3 times per week; finally, 3.7% of female students declare to practice PA > 3 times per week, while 30.8% of male students declare to practice PA > 3 times per week.

**Conclusions.** In conclusion, we think that studies like ours are essential for formulating plans to enhance students' wellbeing and their academic route inside universities.

**Keywords:** physical fitness, university students, undergraduate, sedentary, health, healthy lifestyle.

### Introduction

The World Health Organization (WHO) has published the new guidelines to combat a sedentary lifestyle, which has worsened due to the pandemic, through physical activity. If the world's population were more active, more than 5 million deaths could be avoided every year. At a time when people are more at home due to Covid-19, the new WHO guidelines on physical activity and sedentary behavior highlight that anyone, of any age and ability, can be physically active and that every type of movement counts. Sadly, however, globally, 1 in 4 adults do not achieve recommended levels of physical activity globally (approximately 1 in 3 women and

1 in 4 men do not exercise enough to stay healthy) and more than 1 in 4 according to the WHO. 80% of the world's adolescents are insufficiently active. Between 2001 and 2016, in high-income countries, the percentage of those who did not practice enough physical activity increased by 5 points (from 31.6% to 36.8%). With the result that, in insufficiently active people, the risk of death increases by 20% to 30% compared to active people.

Previous research has revealed that unhealthy habits that are modifiable, such smoking, eating badly, not exercising, and drinking alcohol, each have a unique impact on the development of non-communicable diseases and early morbidity (Joseph et al., 2017; Liu et al., 2012; WHO 2010). Compared to older persons, young people, particularly university students, are more prone to lead unhealthy lives. The global epidemic of overweight, obesity, and sedentary

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lifestyle is a serious public health problem because it has the potential to increase the prevalence of cancer, type 2 diabetes, metabolic disorders, and cardiovascular diseases (Hultgren et al., 201). When young people are attending college, adolescent-starting habits usually solidify and last until adulthood (Deasy et al., 2014). The effects of a number of different health-related risk factors have been studied in the past, but neither their clustering behaviors nor their synergistic effects in a university setting have been studied. However, a few studies (El Ansari et al., 218; Murphy et al., 2019; Brunet et al., 2010; Meader et al., 2016) suggest that unhealthy lifestyles frequently coexist with one another. The existence of such clustering may have significant implications for studies of morbidity and mortality as well as the design of preventative and health promotion initiatives because it implies that interventions should focus on the overall lifestyle rather than just one aspect. The development of strategies that lead to an increase in the diffusion of physical activity, through the activation of interventions of proven effectiveness, is a public health objective that can only be achieved through targeted health policies, shared objectives and identification of responsibilities. The positive effects of widespread physical activity (PA) at the community level are evident at both the social and economic levels. The community benefits not only in terms of a reduction in public health costs, an increase in productivity, better efficiency in schools, a reduction in absenteeism at work, but it would also record an increase in participation in recreational and relational activities. Promoting physical activity is therefore a priority public health action, often included in health plans and programming around the world. In the United States, in fact, the Healthy People 2010 program identifies physical activity as one of the main health objectives for the country.

The term “physical activity” (PA) refers to “any body movement produced by skeletal muscles that requires energy expenditure” (Caspersen et al., 1985), including those performed for recreation, transportation, or employment. Exercise, which is “a subtype of PA that is planned, structured, repetitive, and attempts to enhance or maintain one or more components of physical fitness,” should not be confused with the term “PA” (World Health Organization 2010, 2018). Instead, the World Health Organization (WHO) defines physical inactivity as “not fulfilling the applicable physical activity recommendations” (World Health Organization 2010, 2018). Physical inactivity is a risk factor for the major non-communicable diseases (NCDs) that cause early death and disability in western countries, according to a growing body of epidemiological research (Cochrane et al., 2019; Tremblay et al., 2017).

Additionally, “any awake behavior characterized by an energy expenditure 1.5 metabolic equivalents” (Lee et al., 2012) is considered sedentary behavior. Sedentary lifestyles have been ranked as the fourth biggest cause of death globally (Gallè et al., 2020). In recent years, PA has largely been replaced by increasingly sedentary habits, particularly among children and young people, and possibilities for physical activity are gradually dwindling for adults and the elderly (Tremmel et al., 2017). Contrarily, it is generally known that PA can be used to prevent non-communicable diseases, promote psycho-physical health, and enhance quality of life in people of all ages and genders. Additionally, people who are physically active typically live longer than

those who are not. Due to all of these advantages, PA may lower the direct and indirect expenditures associated with a sedentary lifestyle (WHO 2011). This is especially important when taking into account the aging of the population in industrialized nations, which is leading to an increase in the burden of chronic diseases (Gallè et al., 2020).

However, there is proof that anyone, regardless of age, who improves their level of physical activity can benefit from it, even after extended periods of inactivity. As a result, in recent years, the WHO, the European Union (EU), and national governments have focused their policy on promoting an active lifestyle. It takes a team effort from all sectors and disciplines to raise the PA level in the population since it calls for a holistic, culturally sensitive approach (Cochrane et al., 2019). In fact, PA promotion is crucial for everyone in society and should be approached from a variety of disciplinary and sectorial perspectives.

The aim of this study was to examine the levels of physical activity among undergraduates living in ADISU (Agency for the Right to University Study) residences in order to better understand their situations and highlight the differences between male and female students.

## Materials and Methods

Eighty participants between the ages of 18 and 28 were enrolled in this study (Tab. 1). The Department of Clinical Experimental worked with ADISU Puglia (Agency for the Right to University Study) to identify all of the subjects, who were all University of Foggia students. The “Lifestyle & World life: enhancing your life while protecting the planet” project was taken up by all of the recruited participants. To do this, epidemiological study was carried out to determine the level of physical activity and way of life of the ADISU Residences. There were no exclusion standards used in this investigation. A questionnaire was issued to each individual re-recruited for the study to gather general information and physical activity levels. A survey was created using Google forms, which allowed for both open-ended and multiple-answer responses.

**Table 1.** Anthropometric characteristics

Parameters	Female	Male
Number (n)	54	26
Systolic pressure	124.25 mmHg ± 20.9	129.03 mmHg ± 19.8
Diastolic pressure	74.53 mmHg ± 13.1	76.92 mmHg ± 10.6
Height (cm)	162.2 ± 6.3	176.3 ± 8.2
Weight (kg)	61.9 ± 15.2	73.6 ± 13.5

## Statistical analysis

The statistical analysis was performed by using IBM SPSS Statistics 23. All the variables related physical activity were analyzed by using descriptive statistic. The frequencies and distribution of the parameters investigated were reported. The multinomial logit model was performed to investigate the differences of the following variables: “SEX”, “Smoker” and “Physical Activity”. The analysis shows the clustering of the frequencies relative to the variable “Physical Activity Frequency” in each group.

**Results**

In this study, the statistical investigation, was conducted in 80 students at the University of Foggia. The sample is not equally distributed regarding the gender; in fact, as show in table one, 67.5% are female students and 32.5% are male students (Tab. 2).

**Table 2.** In this table were reported the frequencies of the variables

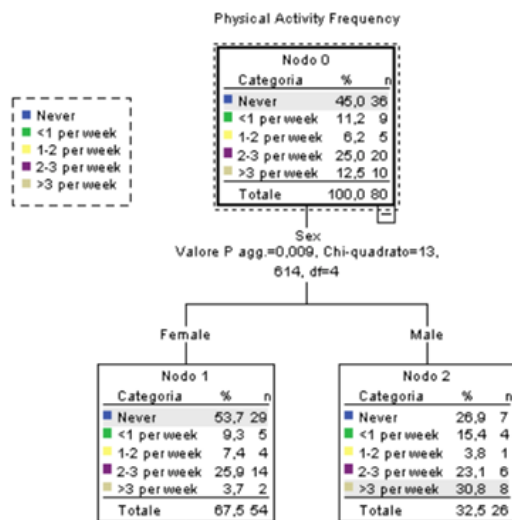
Sex	Frequency	Valid. Percentage	Cumulative Percentage
1	54	67.5	67.5
2	26	32.5	100
Total	80	100	

“SEX” (1= woman; 2= man)

Further analysis was performed to investigate the sample on smoking habit. The results shows that the 60% of the students involved in this investigation are smoker (Tab. 3).

**Table 3.** In this table were reported the frequencies of smoker students (Smoker: 1= yes; 2= no)

Smoker	Frequency	Valid. Percentage	Cumulative Percentage
1	32	40	40
2	48	60	100
Total	80	100	



**Fig. 1.** Decision tree model analysis

**Table 4.** In this table were reported the differences between smoker and nonsmoker students

Smoker	Parameters	Physical Activity	Physical Activity Frequency
1	Mean	1.43	2.16
	N	32	32
	Minimum	1	1
	Maximum	2	5
	Std. Deviation	0.483	1.505
	Kurtosis	-1.629	-0.725
	Skewness	0.691	0.928
2	Mean	1.56	2.71
	N	48	48
	Minimum	1	1
	Maximum	2	5
	Std. Deviation	0.501	1.57
	Kurtosis	-2.018	-1.719
	Skewness	0.260	0.061
Total	Mean	1.48	2.49
	N	80	80
	Minimum	1	1
	Maximum	2	5
	Std. Deviation	0.503	1.559
	Kurtosis	-2.041	-1.544
	Skewness	0.102	0.373

(Smoker: 1= yes; 2= no; Physical Activity: 1= yes; 2= No; Physical activity frequencies: 1= never; 2= <1per week; 3= 1-2 per week; 4= 2-3 per week; 5= >3 per week).

Furthermore we also performed the investigation of the practice of physical activity in smoker group and nonsmoker students (Tab. 4).

In the table above was reported the difference in average rates: in both cases, nonsmokers, shows a higher average than smokers, indicating greater physical activity and higher frequency. To get an overview of the variables, a summary descriptive table was presented (Tab. 5).

Another analysis performed was the “decision tree model” (Fig. 1). This further analysis highlights the different levels of physical activity practice in relation to gender differences. Furthermore the 52.3% of female students declare to not practice any PA compared to 26.9% of male students; the 9.3% of female students declare to practice PA <1 time per week, while the 15.4% of male students declare to practice PA <1 time per week; the 7.4% of female students

**Table 5.** This table show the descriptive statistics of the sample regarding the following parameters: Sex, Smoker, age and physical activity

Parameters	N	Minimum	Maximum	Mean	Skewness	Kurtosis
Sex	80	1	2	1.33	0.762	-1.457
Smoker	80	1	2	1.6	-0.416	-1.874
Age	80	18	28	21.21	1.121	1.477
Physical Activity	80	1	5	2.49	0.373	-1.544

There are two dichotomous variables “Sex” and “Smoker,” one scalar variable “Age” (range 18 to 28 years) and the nominal variable “Physical Activity Frequency”. Variables show positive skewness (except for the variable “Smoker”). (Sex: 1= woman; 2= man; Smoker: 1= yes; 2= no; Smoker: 1= yes; 2= no).

declare to practice PA 1-2 time per week, while the 3.8% of male students declare to practice PA 1-2 time per week; the 25.9% of female students declare to practice PA 2-3 time per week, while the 23.1% of male students declare to practice PA 2-3 time per week; Finally, the 3.7% of female students declare to practice PA >3 time per week, while the 30.8% of male students declare to practice PA >3 time per week.

## Discussion

The main finding of this study are: 1) the 60% of the students involved in this investigation are smoker; 2) non-smokers, shows a higher average than smokers, indicating greater physical activity and higher frequency; 3) the 52.3% of female students declare to not practice any PA compared to 26.9% of male students; the 9.3% of female students declare to practice PA <1 time per week, while the 15.4% of male students declare to practice PA <1 time per week; the 7.4% of female students declare to practice PA 1-2 time per week, while the 3.8% of male students declare to practice PA 1-2 time per week; the 25.9% of female students declare to practice PA 2-3 time per week, while the 23.1% of male students declare to practice PA 2-3 time per week; Finally, the 3.7% of female students declare to practice PA >3 time per week, while the 30.8% of male students declare to practice PA >3 time per week. This study is important to verify the student's lifestyle to obtain detailed report to be able, if necessary, to propose improvement strategies. In fact, accordingly to WHO, adults (aged 18-64 years) Should also engage in muscle-strengthening activities at moderate or greater intensity that involve all major muscle groups on 2 or more days a week, as these provide additional health benefits. Should do at least 150-300 minutes of moderate-intensity aerobic physical activity; at least 75-150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous-intensity activity throughout the week. All individuals, especially older adults, should strive to engage in more than the advised amounts of moderate- to vigorous-intensity physical activity. Physical activity of any intensity can help lessen the negative effects of high levels of sedentary behavior on health (WHO 2018).

In actuality, consistent physical exercise, such as walking, cycling, wheeling, playing sports, or engaging in active leisure, has major positive effects on health. It is preferable to engage in some exercise than none. People can easily reach the necessary exercise levels by increasing their daily activity in relatively easy methods (Moscatelli et al., 2020). One of the main risk factors for non-communicable diseases mortality is physical inactivity. Compared to those who are appropriately active, those who are insufficiently active have a 20%–30% higher risk of dying. Exercise on a regular basis can: decrease the incidence of depression, hypertension, coronary heart disease, stroke, diabetes, various cancers (including breast cancer and colon cancer), falls, hip or vertebral fractures, and increase muscular and cardiorespiratory fitness. It also helps maintain a healthy body weight. Furthermore, our study, highlight the great percentage (60%) of smoker students.

More than 8 million people die each year from the tobacco epidemic, which is one of the greatest risks to global public health. This figure includes roughly 1.2 million fatalities from exposure to secondhand smoke (Global Burden of

Disease 2019; Huang et al., 2014; Polito et al., 2019, 2020; Sperandeo et al., 2020; Di Maio et al., 2020). There is no level of cigarette exposure that is safe; all kinds of tobacco are toxic. The most prevalent method of tobacco consumption worldwide is cigarette smoking. Other tobacco goods include bidis, kreteks, cigars, cigarillos, roll-your-own tobacco, waterpipe tobacco, and numerous smokeless tobacco items. The economic consequences of tobacco use are large and include high medical expenses for treating diseases brought on by tobacco use as well as the lost human capital as a result of morbidity and mortality linked to tobacco use. Moreover, the smoke that is exhaled by the smoker as well as the smoke that is released from the burning end of a cigarette or other smoking devices (such bidis and water pipes) is referred to as second-hand tobacco smoke. There is no safe threshold of exposure to secondhand cigarette smoke because more than 4000 compounds have been found in tobacco smoke (Monda et al., 2017; Precenzano et al., 2017; Moscatelli et al., 2016; Maldonato 2018).

The Conference of the Parties to the WHO Framework Convention on Tobacco Control (WHO FCTC) has determined that the only effective strategy to fully protect people's health from the damaging effects of secondhand tobacco smoke is to have 100% smoke-free settings. Smoke-free regulations are popular because they don't hurt business and they help smokers stop while also protecting the health of non-smokers. Unfortunately, the results of our study, when compared to national data, are decidedly alarming since, according to the data of the "Report on smoking in Italy", presented on the occasion of World No Tobacco Day 2022 (World No Tobacco Day, 31 May), almost one in four Italians (24.2% of the population) is a smoker: a percentage that had never been recorded since 2006. After a long period of stagnation, this year we are witnessing an increase of 2 percentage points: in fact, smokers were 22% in 2019, the last year of the pre-pandemic survey. The trend observed in the three-year period 2017-2019 which saw a constant decrease in female smokers is not confirmed in 2022: this year, in fact, there is an increase in the percentage of smokers of both sexes. People who smoke cigarettes with heated tobacco are also on the increase: 3.3% in 2022 compared to 1.1% in 2019, but more than one in three people (36.6%) consider them less harmful than traditional ones.

## Conclusions

This is the first investigation conducted in the University of Foggia students. The data revealed lower physical activity practices level and a higher number of smoker students. Given the results obtained, it would be appropriate to implement strategies capable of increasing sports practice and, at the same time, decreasing the number of smoking students. While our study is found to be important for student health implications, we believe it has some limitations. In fact, it would be advisable to increase the sample and compare the results between students who reside in university residential structures and those who instead reside in their own homes. Furthermore, the parameters could also be evaluated in relation to the year of the course attended. In conclusion, although our study has some limitations, we believe that surveys like ours are fundamental for setting strategies for improving the health of students and their educational path within universities.

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## Conflict of interest

The authors declare that there is no conflict of interest.

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## ВІДМІННОСТІ В РІВНЯХ ФІЗИЧНОЇ АКТИВНОСТІ СТУДЕНТІВ І СТУДЕНТОК УНІВЕРСИТЕТУ

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Авторський вклад: А – дизайн дослідження; В – збір даних; С – статаналіз; D – підготовка рукопису; E – збір коштів

Реферат. Стаття: 7 с., 5 табл., 1 рис., 33 джерела.

**Мета дослідження.** Метою цього дослідження було вивчити рівні фізичної активності студентів, які мешкають у гуртожитках ADISU (Агентство з права на навчання в університеті), щоб краще зрозуміти їхні обставини та висвітлити відмінності між студентами та студентками.

**Матеріали та методи.** У цьому дослідженні взяли участь 80 учасників віком від 18 до 28 років. Кожному учаснику, відібраному для дослідження, було надано анкету для збору загальних даних та вимірювання рівня фізичної активності.

**Результати.** 60% студентів, залучених до цього дослідження, курять; некурці показують вищий середній показник, ніж курці, що вказує на більшу фізичну активність і більшу її частоту; 52,3% студенток заявляють, що не займаються жодною ФА порівняно з 26,9% студентів; 9,3% студенток заявляють, що займаються ФА < 1 разу на тиждень, тоді як 15,4%

студентів заявляють, що займаються ФА < 1 разу на тиждень; 7,4% студенток заявляють, що займаються ФА 1-2 рази на тиждень, тоді як 3,8% студентів заявляють, що займаються ФА 1-2 рази на тиждень; 25,9% студенток заявляють, що займаються ФА 2-3 рази на тиждень, тоді як 23,1% студентів заявляють, що займаються ФА 2-3 рази на тиждень; нарешті, 3,7% студенток заявляють, що займаються ФА понад 3 рази на тиждень, тоді як 30,8% студентів заявляють, що займаються ФА понад 3 рази на тиждень.

**Висновки.** Підсумовуючи, ми вважаємо, що дослідження, подібні до нашого, необхідні для складання планів покращення добробуту студентів та їхнього освітнього шляху в університетах.

**Ключові слова:** фізична підготовленість, студенти університету, студент, малорухливий, здоров'я, здоровий спосіб життя.

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