

Impact of Dietary Patterns Among Students of the University of Lahore on their Health Status and Academic Performance

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Abstract:

A large number of students start to achieve bad academic score in the university. There can be multiple factors but one of the most important factor is change in dietary patterns.

Objective:

To find out the impact of dietary patterns among students of The University of Lahore on their health status and academic performance.

Methods:

A cross-sectional study was conducted at The University of Lahore Defence Road Lahore and completed within 9 months using the purposive sampling technique. The data were collected through pre-tested questionnaire from 384 students. Data were analysed using SPSS version 22.0. Frequencies were calculated, Pearson's chi-square test and Paired sample t-test were applied.

Results:

Total of 384 students were included in the study. Among all of them, 87.5% students were having breakfast and 29.6% were having grade A- and 0% having grade A among those who did not take breakfast and this difference was significant (p -value < 0.05). Similarly, students who consumed fresh juices at morning snack time were good grades achievers with percentage of 60.1% as compare to who did not consume fresh juices with percentage of 39.8%. Almost all the students who were taking a healthy meal were among the good grades achievers.

Conclusions:

It was concluded from the current study that there is a direct relation between dietary patterns and good grades in the academics.

Key words:

Dietary pattern, University students, academic score, meals, health status.

Introduction:

University time is a basic period which brings various alterations in eating practices. University students inclined to miss meals and develops irregular dietary habits, for this reason they tend to start suffering from deficiencies of fundamental nutrients of dietary problems and weight again or obesity. Also it would additionally lower the educational performance of students. The poorly consuming habits which consist of skipping meals, consuming far from home, constant eating, high intake of fast food and carbonated drinks.¹ Diet is that quantity and form of meals eaten by a person which contains various nutrients. While, nutrients is characterized as any substance that is processed, assimilated and used to help in body function and these are; starches, proteins, fats, vitamins, mineral salts, trace elements and water.² Nutritional status is the stability between the intake of nutrients by an organism and the consumption of these nutrients in treatment of development, multiplication, and wellness.³ Nutritional status has prompt immediate impact on overall academic performance of students if it's disturb then it may be irregular. Dietary patterns represent boundless description of meals and nutrient intake, described on the premise of common eating behavior.⁴ Dietary evaluation in which different nutritional components or vitamins are analyzed simultaneously or together rather than independently.⁵ There are five essential techniques to check the nutritional intake, only two strategies are commonly used for nutritional assessment. 24-hour intake history and dietary questionnaires.⁶ Anthropometry has been extensively and helpfully actualized to assess wellness and nutritional hazard. Anthropometry is the quantitative size of human body.⁴ Anthropometry measures to survey dietary assessment: weight, BMI and skinfold thickness.⁷ Skinfold thickness is a broadly utilized body

composition test towards body fat ratio. A skinfold harpenden caliper is used to measure thickness of skin and convert body fats composition in ratio. If high amount fat collects inside the body it prompts overweight and obesity.⁸ Skinfold thickness is measure in four areas. Biceps, triceps, sub-scapula, supra-iliac areas. The sum of all these four values should to be less than 40mm in male and less than 50mm in female. Body Mass Index (BMI) is a basic indicator of weight-for-height (in kg/m²) that is ordinarily used to evaluate underweight, overweight and obesity. Overweight is a BMI more prominent than or equivalent to 25 and obesity is a BMI more than or equivalent to 30.⁹ High level of utilization of healthy patterns would prompt littler puts on in weight and BMI.¹⁰ A diet that contains the proper amount of starches, fats, proteins, vitamins, minerals, and water required to keep up great health.¹¹ Balanced and healthy diet will change depending upon person needs (e.g. age, sex, way of life, level of physical activity). A healthy diet contains organic products, lentils, beans, vegetables, vegetables oats, wheat, darker rice, nuts and entire grains (e.g. natural maize, millet).¹²

A study conducted by Taha Z and Rashed AS, 2017 in Abu Dhabi, 130 female students aged 15-19 years were selected. Researcher examined the correlation between breakfast intake and academic performance. 62% out of 130 students were taking breakfast regularly. Breakfast consumption was correlated with increased academic performance among high school female students. The correlation of breakfast intake showed to be statistically significant ($p=0.000$).¹³ Another study conducted by Phillips GW in (2005). Study showed that exclusive 65.6% of the college students were taking breakfast while 34.5% students were not taking breakfast. During the duration of the study 188 students scored "A" on the second exam, this incorporates 17.7 percent of the students were taking breakfast and 9.7 percent of those were not taking breakfast. It was concluded that 38.2 percent of the students were taking breakfast scored "B" while 18.7 percent of the students were not taking breakfast scored "B". In case of, C grade only 16.9 percent of the students were taking breakfast and 22.4 percent of students were not taking breakfast scored "C". Whereas, 13.7 percent students were taking breakfast scored D and 17.1 percent for those

who were not taking.¹⁴ Another study was conducted by Ludin AF and Lim Slin 2016, among second year undergraduates of Faculty of Health Sciences, University Kebangsaan Malaysia, Malaysia. Relationship between type of education and habit of breakfast consumption was not statistically significant, $\chi^2 (3, N=164) = 2.590, p > 0.05$. Factors that significantly influenced on breakfast utilization and academic performance were environmental factors ($p < 0.05$) which involved the aspects of family background, food choices and accessibility.¹⁵ A study was conducted by Arshad N and Ahmed U in (2014) on university students. Study explored that what are "Impact of breakfast habits on education performance of university students. 240 students were selected. Study showed that 47% were not taking breakfast that become the reason of brain damage and makes the student cognitive level low.¹⁶ Another study was conducted by Ogunsile SE in (2012). Study showed that 7.0 % were consuming milk at least one time per day, 16.4% were taking breakfast. 14.1% showed regular consumption of three square meals, 16.4% were consuming fruit daily, 10.2% were consuming vegetables daily and 45.3% were consuming soft drinks. Breakfast utilization, taking three square meals and consumption of fruits and vegetables everyday all were significant impacted ($P < 0.05$) on the academic performance.¹⁷

The purpose of study is to evaluate the impact of nutritional status and academic performance and it will help in maintaining the nutritional status of the students as well as improving their academic performance and overall cumulative grade point average (CGPA).

Methods:

The study was conducted at The University of Lahore Defence Road campus, among students of Doctor of Dietetics and Nutritional Sciences (DDNS), Master of Philosophy in Human Nutrition and Dietetics (PHND) and Doctor of physiotherapy (DPT), over a period of nine months. A total of 384 students were included in the study using purposive sampling technique. All females and males students from 3rd semester to 10th semester of Doctor of Dietetics and Nutritional Sciences (DDNS), students from 4th semester of Master of Philosophy in Human Nutrition and Dietetics (PHND), students from 9th semester of

Doctor of physiotherapy (DPT) were included while all students of other departments, non-cooperating students and unhealthy students were excluded. Data were collected using a pre-tested questionnaire via interview method. Data were analyzed with the help of SPSS version 20.0. Pearson's Chi-square test was applied to evaluate the impact of dietary patterns on academic performance. Paired sample t-test was also applied to evaluate the difference between BMI (Body Mass Index) from past 6 months and current BMI (Body Mass Index) of students. The results were presented in the form of tables and each table was interpreted separately.

Results:

The summarized demographics of 384 respondents. Among all respondents 7.6% were males and 92.4% were females. 49.4% of the students range from 18-20 years and 50.5% range from 21-25 years. Students from 3rd semester to 10th semester of Doctor of Dietetics and Nutritional Sciences (DDNS) were 92.7%, 1.3% were from 4th semester of Master of Philosophy in Human Nutrition and Dietetics (PHND) and 5.9% were from 9th semester of Doctor of physiotherapy (DPT) as shown in Table 1.

Attributes	Frequency	Total	Percentage (%)
Male	29	384	7.6
Female	355	384	92.4
Age (18-20)	190	384	49.4
Age (21-25)	194	384	50.5
Class DDNS (3 rd semester – 10 th semester)	356	384	92.7
Class M.Phil. Nutrition (4 th semester)	5	384	1.3
Class DPT (9 th semester)	23	384	5.9

Table 1: Demographic Profile of participants

Table 2 highlighted the different frequencies and relationship of breakfast consumption and academic performance of 384 students. Among 384 students, 87.5% students were taking breakfast, 12.5% students were not taking breakfast. Among all of them, 29.6% were taking breakfast had their grades A⁻. Only 0.520% students were taking breakfast had their grades C. The p-value was 0.000, which means breakfast consumption and grades of the students have significant association.

Breakfast Consumption	Academic performance							Total sample size=384	P-value
		A	A-	B+	B	C+	C		
	Yes	26 (6.7%)	114 (29.6%)	74 (19.2%)	84 (21.8%)	36 (9.3%)	2 (0.5%)	336 (87.5%)	0.000
	No	0	0	4 (1.04%)	8 (2.0%)	34 (8.8%)	2 (0.5%)	48 (12.5%)	

Table 2: Breakfast Consumption

According to Table 3 the consumption of fresh juice among 384 students, 60.1% students were consuming fresh juice and 39.8% students were not consuming fresh juice. Among all of them, 29.4% students were consuming fresh juice had their grades A⁻. 1.0%

students were consuming fresh juice had their grades C⁺. The p-value was 0.000, which means consumption of fresh juice has significant association with grades of the students.

Fresh juice Consumption	Academic performance							Total sample size=384	P-value
		A	A-	B+	B	C+	C		
	Yes	26 (6.7%)	113 (29.4%)	67 (17.4%)	21 (5.4%)	4 (1.0%)	0	231 (60.1%)	0.000
	No	0	1 (0.26%)	11 (2.8%)	71 (18.4%)	66 (17.2%)	4 (1.0%)	153 (39.8%)	

Table 3: Fresh juice Consumption

Table 4: has showed the consumption of soft drinks among 384 students, 55.9% students were consuming soft drink and 44.0% students were not consuming soft drink. Among all of them, 22.6% students were consuming soft drink had their grades B. 0.260%

student was consuming soft drink scored A. The p-value of result was 0.000, which means consumption of soft drinks has significant association with grades of the students.

Soft drink Consumption	Academic performance							Total sample size=384	P-value
		A	A-	B+	B	C+	C		
	Yes	1 (0.2%)	29 (7.5%)	27 (7.03%)	87 (22.6%)	67 (17.4%)	4 (1.04%)	215 (55.9%)	0.000
	No	25 (6.5%)	85 (22.1%)	51 (13.2%)	5 (1.3%)	3 (0.7%)	0	169 (44.0%)	

Table 4: Soft drinks Consumption

As shown in table 5 the consumption of vegetable salan among 384 students, 95.3% students were consuming vegetable carry and 4.6% students were not consuming vegetable curry. Among all of them, 29.1% students were consuming vegetable

curry had their grades A-. 0.78% students were consuming vegetable curry had their grades C. The p-value was 0.001, which means consumption of vegetables has significant relationship with grades of the students

Vegetable curry Consumption	Academic performance							Total sample size=384	P-value
		A	A-	B+	B	C+	C		
	Yes	26 (6.7%)	112 (29.1%)	78 (20.3%)	81 (21.0%)	66 (17.1%)	3 (0.7%)	366 (95.3%)	0.001
	No	0	2 (0.5%)	0	11 (2.8%)	4 (1.04%)	1 (0.2%)	18 (4.6%)	

Table 5: Vegetable curry Consumption

According to the Table 6 the consumption of milk among 384 students, 71.3% students were consuming milk and 28.6% students were not consuming milk. Among all of them, 28.6% students were consuming

milk had their grades A-. 0.260 % student was consuming milk scored C. The p-value was 0.000, which means milk consumption at bed time has significant relationship with grades of the students.

Milk Consumption	Academic performance							Total sample size=384	P-value
		A	A-	B+	B	C+	C		
	Yes	26 (6.7%)	110 (28.6%)	69 (17.9%)	43 (11.1%)	25 (6.5%)	1 (0.2%)	274 (71.3%)	0.000
	No	0	4 (1.0%)	9 (2.3%)	49 (12.7%)	45 (11.7%)	3 (0.7%)	110 (28.6%)	

Table 6: Milk Consumption

Discussion:

In current study it was noted that there were 87.5% students who were having breakfast and showed good academic performance, a significant difference was noted in the students who have been taking breakfast to those who did not taking breakfast in terms of good academic performance which was supported by Taha Z and Rashed AS, and Ogunsile SE.^{13,17} A study reported that 65.5% students who had taken breakfast and 34.5% students who never had taken breakfast. During the period of the study 15% students scored "A" on the second exam, this includes 17.7% of the students who had taken breakfast and 9.7% of those who never took breakfast. It was concluded that 38.2 percent of the students were taking breakfast scored "B" while only 18.7 percent of the students were not having breakfast scored "B". Only 16.9 percent of the ones were eating breakfast scored C grades and 22.4 percent of those were not having breakfast scored "C" stated by Phillips GW.¹⁴ While in current study 87.5% were taking breakfast. 29.6% were taking breakfast have their grade A. 21.8% were taking breakfast have their grade B. Only 2.0% percent were not taking breakfast and have their grade B. 0.520% students were taking breakfast have their grade C. 0.520% students were not taking breakfast have their grade C. These results were little different as mentioned by the study of Phillips GW.¹⁴ In current study poor academic performance was associated with the missing of breakfast. Among students who were not having breakfast (12.5%) majority (8.8%) were achiever of grades C. This was supported by some studies that suggested, students who skipped their breakfast leading to their brain damage and made the students' academic learning low as evaluated by Ranjana S *et al*, 2013, Arshad N and Ahmed U, and Goon S and Bipasha MS.^{18, 16,19} Some studies were

conflicting with current study. There was no impact of education noted on habit of breakfast which was contrary to a study that stated, association of education with habit of breakfast consumption was not statistically significant due to environmental factor which involved the aspects of family background, food choices and accessibility conducted by Ludin AF and Linm SL.¹⁵ In two studies conducted by Kim SY *et al*, and Stea TH and Torstveit MK reported that frequent intake of breakfast were correlated with high academic performance which were further supported the findings in the current study (P=0.000).^{20,21} Some other study found that 16.4 percent students ate fruits daily, 10.2 percent students ate vegetables daily. Fruits and vegetables consumption had positive correlation with academic performance which were consistency with results of the studies by Ogunsile SE, Kim SY *et al*, and Mpofu M.^{17,20,2} These finding studies results were similar with current study. Fruits and vegetables showed significant with each (p=0.000). Grades of the students depend upon the consumption of fruits and vegetables. Another study reported that 45.3% students had consumed soft drinks daily it was found soft drinks had not effected on academic performance as stated in study by Ogunsile SE *et al*.¹⁷ Another study reported that soft drinks intake was negatively correlated with academic performance supported by the study of Kim SY *et al*, 2016.²⁰ These studies results contradict with current study. Because current study showed that grades of the students depend upon consumption of soft drinks. Finding of previous studies showed the regular intake of milk increase the academic performance of the students as suggested by Ogunsile SE and Kim SY *et al*,.^{17,20} Studies of these finding were similar with current study which showed significant results that consumption of milk also effect

the grades of the students.

Conclusions:

It was concluded from the current study that there is a direct relation between dietary patterns and good grades in examination. There was change in dietary pattern that has resulted in the lower mental capability and ultimately low grades in the academics. There is still a great need of extensive awareness through health education regarding the intake of balance diet at the proper meal timing.

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